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MATTERING AND MEMORY: THE EFFECTS OF PERSONAL
IMPORTANCE ON AUTOBIOGRAPHICAL MEMORY AND
MEMORY FOR FREQUENCY OF OCCURRENCE

by

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the Department of
Psychology in the Graduate School
of Duke University

ABSTRACT

(Psychology-Clinical)

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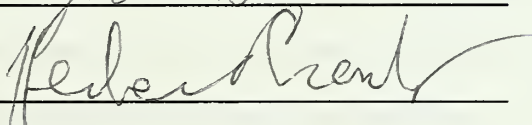
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ABSTRACT

Recent work in the area of social cognition has increasingly addressed the manner in which cognitive processes are affected by relatively long-term individual differences in the salience of certain social stimuli over others. The present set of studies explores the effects of differences in the relative personal importance of behavior domains on autobiographical memory and memory for frequency of occurrence--areas of memory deployed in day-to-day adaptation to the environment.

Behavior domains of high and low personal importance were preassessed by means of questionnaire. In the autobiographical memory study, subjects were cued for positive, negative, rare, and commonplace personal memories in high and low importance domains. Memory dates and recall latencies were also collected. Subjects then evaluated their memories in terms of 18 attributes, including emotional and imagistic vividness, confidence of recall, pleasantness, frequency of rehearsal, and self-descriptiveness.

In the frequency of occurrence study, each subject was presented with a list of 90 words that included target words representing his or her high and low importance domains. Whereas nontarget words varied in frequency, all domain words were presented with equal frequency. In the memory test, subjects were presented with pairs of target words

and were asked to indicate which word in the pair had appeared most frequently. Subjects also ranked the frequency with which they have encountered domain words in various real-life social contexts.

The autobiographical study yielded a large number of significant findings, many of them higher order interactions. In general, personal importance was found to mediate the effects of other variables on memory attributes; for instance, subjects judged positive memories as more descriptive of self than negative memories, but only in the case of high importance domains of behavior.

Personal importance was also found to affect frequency estimates. Despite identical presentation frequencies, subjects estimated that high importance words were presented significantly more frequently in the list than were low importance words. Personal importance also had significant effects on estimates of frequency of encounter with domain words and behaviors in real-life contexts.

The present findings underscore the need to examine further the impact of individual differences in the meaningfulness of stimuli on social cognitive and memorial processes.

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I wrote much of this dissertation during my clinical internship

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P. F.

CONTENTS

	Page
ABSTRACT	iii
ACKNOWLEDGMENTS	v
LIST OF TABLES	x
 Chapter	
I. THE SEARCH FOR THE EFFECTS OF PERSONAL IMPORTANCE ON MEMORY: GENERAL THEORETICAL ISSUES AND RATIONALE	
Cognition in a Vacuum: A General Assessment of Underlying Assumptions in Past Research on Social-Cognitive and Memorial Processes	4
Beginning to Fill the Vacuum: Research on Non- Deliberate Cognitive Processes	7
Past Research on Effects of Individual Differences in the Salience of the Contents of Cognition	9
Personal Importance: Do We Really Need Another Construct?	12
II. PERSONAL IMPORTANCE AND AUTOBIOGRAPHICAL MEMORY	
Introduction	22
Past Research in Autobiographical Memory	23
Summary and Critique of Past Research on the Role of Personal Importance in Autobiographical Memory	34
Method	54
Subjects	54
Assessment of Independent Variable: High and Low Importance Domains	54
Selection of Subjects for Study	60
Assessment of Dependent Variables: Attributes and Aspects of Autobiographical Memories	60
Procedure	62
Summary of Method and Procedure	65

Results	66
Presentness of Memories	67
Event Complexity	78
Affective Aspects of Autobiographical Memories	81
Event Consequentiality	90
Event Predictability and Frequency	95
Memory of Intentions and Sense of Control in Autobiographical Events	105
Memories and Self-Concept: Self-Descriptiveness and Age-Relatedness	110
Temporal Variables: Memory Dating and Recall Latencies	117
Discussion	120
Domain Importance and Recallability	124
Specific Findings on Autobiographical Recall	127
Summary: The Relation Between Present Findings and Past Research on Recallability	154
Affective Qualities of Autobiographical Memory	158
Domain Importance and Consequentiality	161
Domain Importance, Autobiographical Memory, and the Self	170
Summary of General Patterns and Specific Findings	172
Directions For Future Research	184
III. THE EFFECTS OF PERSONAL IMPORTANCE ON MEMORY FOR FREQUENCY OF OCCURRENCE	
Introduction	188
Memory for Frequency of Occurrence: Automatic or Open to Influence?	189
Meaningful Questions About Memory for Meaningful Stimuli: A Critique of the Current Literature and Directions for Further Research	200
The Effects of Domain Importance on Memory for Frequency of Occurrence: Some Tentative Predictions	205
Overview of the Present Study	207
Method	209
Subjects	209
Domain Assessment and Subject Selection	209
Selection and Arrangement of Experimental Stimuli: Word Lists	209
Procedure	213

Results	214
Memory of Frequency of Domain Words	215
Frequency Estimates of Real-Life Occurrence of Behavior Descriptors	223
Discussion	229
Biases and Automaticity	230
Theoretical Explanations for Importance Biases in Frequency Memory	234
Patterns in the Estimation of Frequency of Occurrence of High and Low Importance Behaviors and Descriptors in Real-Life Contexts	245
Summary: The Effects of Domain Importance on Frequency Memory	255
IV. PERSONAL IMPORTANCE AND MEMORY: GENERAL IMPLICATIONS OF THE PRESENT FINDINGS	
The Automatic Effects of Personal Importance: Adaptation or Error?	260
APPENDIX A: QUESTIONNAIRES AND ANSWER SHEETS	268
APPENDIX B: ANALYSIS OF VARIANCE TABLES FOR ALL DEPENDENT VARIABLES IN AUTOBIOGRAPHICAL MEMORY STUDY AND FREQUENCY MEMORY STUDY	283
REFERENCES	309

LIST OF TABLES

Table	Page
1a. Interactions for Presentness Variables: Image Vividness	68
1b. Interactions for Presentness Variables: Confidence of Recall	71
1c. Interactions for Presentness Variables: Frequency of Rehearsal	74
2. Interactions for Event Complexity	79
3a. Interactions for Affective Attributes of Autobiographical Memory: Emotional Vividness	83
3b. Interactions for Affective Attributes of Autobiographical Memory: Pleasantness	85
3c. Interactions for Affective Attributes of Autobiographical Memory: Desirability	87
4. Interactions for Consequentiality Variables	92
5a. Interactions for Predictability and Frequency Variables: Novelty	97
5b. Interactions for Predictability and Frequency Variables: Expectancy	99
5c. Interactions for Predictability and Frequency Variables: Likelihood	101
6. Interactions for Memory of Intentions: Relative Focus on Intentions Versus Outcomes	106
7a. Interactions for Memories and Self-Concept: Self-Descriptiveness	111
7b. Interactions for Memories and Self-Concept: Age-Relatedness	114

8.	Interactions for Temporal Variables: Memory Dating	118
9.	Presence and Absence of Significant Effects of Personal Importance on 20 Dependent Variables	121
10a.	Frequencies, Percentages, and Chi Squares for High Versus Low Importance Frequency Endorsements for Males and Females Combined	217
10b.	Frequencies, Percentages, and Chi Squares for High Versus Low Importance Frequency Endorsements for Males Only	217
10c.	Frequencies, Percentages, and Chi Squares for High Versus Low Importance Frequency Endorsements for Females Only	217
11a.	Frequencies, Percentages, and Chi Squares for Positive Versus Negative Endorsements for Males and Females Combined	220
11a.	Frequencies, Percentages, and Chi Squares for Positive Versus Negative Endorsements for Males Only	220
11a.	Frequencies, Percentages, and Chi Squares for Positive Versus Negative Endorsements for Females Only	220
12a.	Importance x Valence Interaction for Frequency of Weekly Encounter with Domain Words	224
12b.	Importance x Gender Interaction for Frequency of Use of Domain Words in Self-Description	224
12c.	Importance x Valence Interaction for Frequency of Description by Mother in Terms of Domain Words	224
12d.	Importance x Valence Interaction for Frequency of Description by Father in Terms of Domain Words	224

CHAPTER I

THE SEARCH FOR THE EFFECTS OF PERSONAL IMPORTANCE ON

MEMORY: GENERAL THEORETICAL ISSUES AND RATIONALE

It is hard . . . to ignore the fact that, however computers may work, grammar arise, or eros unfold, thinking as we find it lying about "in nature" is nothing if not various.

Clifford Geertz

What we want to know, I think, is how people use their own past experiences in meeting the present and the future.

Ulric Neisser

Our memory represents the world to us. Memory provides each of us with an ever-expanding fund of information about the world we share, as well as with a record, however sketchy and selective, of the episodes and events that make up our individual past, our personal history (Tulving, 1972). Thus, factors that influence what we remember affect what we know of our world--indeed, these factors, through their influence on memory, affect what comes to constitute the very nature of the world for us. Many of these factors may wield their influence without effort or intention on our part.

One such factor which may affect the content of our memory is the nature of what matters to us, our personal concerns, our values--what we each individually find important about our world. In turn, the manner in which we partition the world into important and unimportant domains results from learning and from personal experiences stored in memory. In essence, then, any effect that personal importance has on

memory reflects the impact of the products of past memory activity on future memory activity.

The present essay, and the research to follow, explores the role of the personal importance of behavior domains in autobiographical memory and memory for frequency of occurrence. These two areas of memory were selected for examination for several reasons. First, these two areas comprise much of what might be called the "pragmatics" of memory--memory used in our day-to-day adaptation to the environment. Many of the occasions in which we engage in the act of remembering center on recollections of the details of past life events, or on estimates of the frequency of occurrence of objects and events. Our daily social and practical activities require frequent reference to episodes of our recent and remote past; likewise, a central aspect of our orientation to the world and our expectancies about the world centers on distinguishing high from low frequency events.

Second, examination of the effects of personal importance on both autobiographical memory and frequency memory allows for a test of these effects in very different experimental paradigms with very different sorts of stimuli. Research in autobiographical memory generally involves cueing recall of relatively rich, complex data, whereas research in frequency memory involves presentation of relatively simple stimuli--namely, words--followed by tests of recall. The stimuli utilized in autobiographical memory research are primarily available only to the subject, whereas the stimuli in a frequency memory task are selected and presented by the experimenter. And the

range and types of questions available in each of the two areas of memory differ widely. Among other things, memories of life events can differ from one another in their vividness, pleasantness, complexity, and self-descriptiveness, as well as in the confidence and frequency with which they are recalled. Estimates of frequency, on the other hand, are just that: estimates of frequency.

Third, both autobiographical memory and memory for frequency of occurrence figure into important issues in the study and treatment of psychopathology. Psychotherapy conducted from any theoretical vantage relies heavily on patients' recall of life events, as well as on estimates of the frequency of these events. Certain clinical perspectives, especially psychoanalytic theory, operate on the assumption that important life events will either be recalled quite vividly or will be relatively inaccessible to recall. However, these assumptions have not been empirically tested. Likewise, biases in memory for the relative frequency of different kinds of events often play a large role in clinical syndromes: Overrepresentation in estimates of the frequency of important negative events versus important positive events is often viewed as one of the cornerstones of depression (Beck, Rush, Shaw, & Emery, 1979). Similarly, disagreements between members of a couple or family about the frequency of various sorts of important interpersonal interactions often form the core of the couple's or family's initial complaint.

The present essay will begin with an overview of the history of the search for personal factors that affect cognition and memory. This general overview will be followed by detailed reviews of the

relevant research in the areas of autobiographical memory and memory for frequency of occurrence. Each review will in turn be followed by reports of original research that bear on the impact of personal importance on memory. The essay will conclude with a general discussion of the implications of the findings from these two studies for an understanding of how personal importance, as one distillate of social experience, affects memory.

Cognition in a Vacuum: A General Assessment of
Underlying Assumptions in Past Research on
Social-Cognitive and Memorial Processes

Historically, research on cognitive processes has largely proceeded under the implicit or explicit assumption that perceivers have no pasts. Research has given little attention to the ways in which a person's unique experiences with the world may shape and guide his or her future cognitive interactions with that world. In the area of memory, researchers have generally followed from Ebbinghaus' (1885/1964) lead in seeking to control personal influences on the outcomes of memory experiments by using nonmeaningful stimuli (Neisser, 1982). Neisser argued that this approach has yielded little knowledge about memory as it occurs in natural contexts.

Likewise, in the last 20 years of research on social cognition, a period dominated by the inference or attribution perspective (Anderson, 1962, 1974; Fiske, Kenny, & Taylor, 1982; Jones & Davis, 1965; Jones & McGillis, 1976; Kelly, 1967, 1971, 1972; Nisbett & Ross, 1980; Ross, 1978), individual differences in cognitive abilities, in expectancies, and in the meaning of various stimuli have largely been

construed as error factors. Inference models assert that social thought optimally proceeds according to the epistemological practices of well-executed social science (McArthur & Baron, 1983). Like social scientists, the naive social perceiver is held to proceed according to certain universally shared principles of ascertaining cause and effect relations between the actor and the environment in which he or she acts. In addition, the perceiver is assumed to utilize the guiding values of the responsible scientist: the mandate to treat all aspects or facts of the perceived event as equally important and equally present, to reason carefully about all possible relationships between observed facts--in short, to use reason, logic, to be "rational."

The perceiver, moreover, is said to approach the task deliberately, seeking to broaden his or her awareness of the event until he or she can draw a fair and just conclusion about the nature of the social event. These underlying goals of fairness, impartiality, and logicity dictate the rules of inference.

In this view, emotions, personal values, expectancies, preferences, sensitivities, and other factors by which perceivers chronically or temporarily differ, both from one another and from situation to situation, interfere with the task of deliberate, self-directed cognition (Ross, 1977). Thus, when such factors have been explored, it has been with the goal of identifying the ways in which they systematically impede rational perception and judgment (see Taylor, 1981, for review).

However, attempts to delineate a circumscribed set of conditions under which errors in social cognition will not occur have been

largely futile (Taylor & Thompson, 1982). As Taylor and Thompson wrote, "Biases, oversights, and shortcuts appear to be intrinsic to the cognitive system. . ." (p. 155).

Three major questions and issues emerge from a critical consideration of the underlying assumptions of the inferential, attributional tradition in social cognition. First, are all cognitive processes and functions carried out deliberately, or do some occur without the awareness or deliberate efforts of the cognizer? Second, when nondeliberate cognition takes the form of a systematic bias, does this bias always represent cognitive error, or is such bias at times adaptive? Third, does the person's history with a particular object of cognition systematically affect the deployment or outcome of cognitive processing?

The third question represents the major focus of the present work. Past efforts to answer this question will be reviewed shortly.

The second question--that of whether "biases" represent error or adaptation--has been mainly addressed on a theoretical, at times almost philosophical, level (Fiske, 1980; Gibson, 1979; Greenwald, 1980; Higgins & King, 1981; Langer, 1978; McArthur & Baron, 1983; Posner & Snyder, 1975; Zajonc, 1980). The present essay will return to this issue in the final chapter.

On the other hand, the question of whether forms of cognitive processing occur without deliberate effort has become a major focus in cognitive and social-cognitive research. This body of research is broadly described in the next section.

Beginning to Fill the Vacuum: Research on
Non-Deliberate Cognitive Processes

In recent years a number of researchers have embraced the notion that these intrinsic biases and shortcuts in cognition are worthy of study in their own right, and that such study may result in a more realistic description of cognitive processes than that afforded by models that set actual information processing against ideal cognitive rules and practices (Jones & McGillis, 1976). Several of these researchers have proposed models that describe the manner in which two systems of cognitive processes coexist and co-operate, both as relates to how persons process information about nonsocial objects and events (Hasher & Zacks, 1979, 1984; Posner & Snyder, 1975; Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977) as well as how they process information about social events (Bargh, 1982, 1984; Costanzo & Dix, 1983; Langer, 1978; Logan & Cowan, 1984; Posner & Snyder, 1975; Zajonc, 1980). Despite important denotative differences between the terms they use to describe these two systems, these theorists hold in common the notion that some forms of information processing occur only as a result of a perceiver's conscious, deliberate, effortful attempts to gain knowledge or information from his or her environment, whereas other forms of processing occur without such deliberate efforts--in other words, "automatically" (Bargh, 1982, 1984; Hasher & Zacks, 1979, 1984; Posner & Snyder, 1975; Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977).

Although there is some debate as to the precise criteria and valid operationalization of automaticity (Fisk, 1986; Greene, 1984;

Jonides, Naveh-Benjamin, & Palmer, 1985; Naveh-Benjamin & Jonides, 1986; Zacks, Hasher, & Hock, 1986), all would agree that automatic processes are those that engage minimal levels of cognitive resources. These processes can and often do proceed without conscious deployment of attention and are not influenced by intentions to process effectively; nor are they affected by practice, concurrent cognitive processes and tasks, or by physiological or emotional states that might be expected to affect attention; nor by the individual's age, intelligence, mental health, or level of education (Bargh, 1982, 1984; Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977; Hasher & Zacks, 1979, 1984).

The distinction between automatic and effortful or strategic processing has been applied to all stages of the cognitive process: attention (Bargh, 1982), encoding (Hasher & Zacks, 1979, 1984; Srull & Wyer, 1979, 1980), evaluation and judgment (Higgins, Rholes, & Jones, 1977). Around each of these stages there has developed a literature that supports the notion that the nature of a person's prior experience with a stimulus can automatically affect how he or she approaches, attends to, absorbs, utilizes, and recalls this stimulus or information related to this stimulus (Bargh, 1982; Bargh, Bond, Lombardi, & Tota, 1986; Bargh & Pietromonaco, 1982; Bargh & Pratto, 1985; Broadbent, 1958, 1971, 1977; Bruner, 1957; Corteen & Dunn, 1974; Corteen & Wood, 1972; Derry & Kuiper, 1981; Deutsch & Deutsch, 1963; Geller & Shaver, 1976; Higgins & King, 1981; Higgins, King, & Mavin, 1982; Higgins, Rholes, & Jones, 1977; Lewis, 1970; Moray, 1959, 1969; Nielsen & Sarason, 1981; Norman, 1968; Srull & Wyer, 1979, 1980;

Treisman, 1964; Treisman, Squire, & Green, 1974; von Wright, Anderson, & Sterman, 1975; Wachtel, 1967).

Although these studies demonstrate the power of automatic processes, and have shown that a person's prior experience with a stimulus can automatically affect cognitive processing, only a few studies have directly addressed the issue of relatively long-term individual differences in persons' "readiness" (Bruner, 1957) to perceive, respond to, and remember particular elements of information. Researchers have generally manipulated the subject's prior experience with a set of stimuli--they have not assessed real-life differences in persons' experiences with stimuli and tested the effects of differential exposure on the outcomes of cognitive tasks. In essence, much of the automatic processing literature, like the attribution literature, sheds light only on "generically" human cognitive processes, and fails to account for ways in which the relationship between the cognizing subject and the object of his or her cognitions may affect the content of those cognitions.

Past Research on Effects of Individual Differences in the Salience of the Contents of Cognition

The few studies that have looked at individual differences in the meaningfulness of information have indicated this to be a crucial issue. Two burgeoning literatures in particular address this issue: namely, the literatures on chronically accessible constructs (Bargh, 1982; Bargh, Bond, Lombardi, & Tota, 1986; Bargh & Pratto, 1985; Higgins & King, 1981; Higgins, King, & Mavin, 1982) and self-reference

(see Higgins & Bargh, 1987, for review; Markus, 1977; Rogers, Kuiper, & Kirker, 1977).

Briefly summarized, the accessible constructs literature, which takes its inspiration from Kelly's (1955) seminal work on personal constructs, proposes that persons differ in the particular constructs that they habitually employ to process social information. A construct becomes chronically accessible through a person's history of experience with the relevant behavior domain: Individual differences in the content of chronically accessible and inaccessible constructs are thus a function of individual differences in the frequency of various types of life experiences (Higgins & King, 1981). Chronically accessible constructs, like constructs made acutely accessible through priming techniques (e.g., Bargh & Pietromonaco, 1982; Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979, 1980) demonstrably affect a wide range of social-cognitive processes, including speed of processing and deployment of attention (Bargh, 1982; Bargh & Pratto, 1985), impression formation and person evaluation (Bargh, Bond, Lombardi, & Tota, 1986; Higgins, King, & Mavin, 1982), and person memory (Higgins, King, & Mavin, 1982). In regards to the findings on memory, chronically accessible constructs have been found to enhance recall of construct-related information significantly as compared to recall of information related to inaccessible constructs (Higgins, King, & Mavin, 1982).

The basic premise underlying the self-reference literature is that the "self" constitutes a uniquely articulated, differentiated cognitive structure; processing information in relation to knowledge

about the self should thus enhance processing and memory performance relative to other cognitive schemas (Markus & Sentis, 1982; Rogers, Kuiper, & Kirker, 1977). In terms of memory performance, information about the self is thought to provide a large number of associates and cues for encoding and later retrieving new information (Rogers et al., 1977).

The self-reference literature has been criticized on a number of theoretical and empirical grounds--among them, that many of the results can be more parsimoniously explained in terms of relative accessibility of constructs (see Higgins & Bargh, 1987). However, the literature generally demonstrates that information processed in reference to self-knowledge (e.g., Rogers et al., 1977) or which is relevant to self-concept (e.g., Markus, 1977) is often attended to more closely, responded to more rapidly, and remembered more fully and accurately than information that is not self-relevant or that is not processed in relation to self (Higgins & Bargh, 1987).

Taken together, the findings from the chronic accessibility and self-relevance/self-reference literatures adduce preliminary support for the notion that differences between persons in their sensitivity to various contents can affect the results of cognizing about these contents. More specifically, these two literatures bear on the theme of the present paper--the role of personal importance in memory. Certainly, both chronic accessibility and personal relevance have face-valid similarities to the notion of personal importance.

However, there are ways in which the notion of the personal importance of behavior domains improves upon the notions of chronic

accessibility and self-reference as frameworks for exploring the role of the individual's stored cognitive history on present memory processes. The next section will describe these improvements, after a brief elucidation of the notion of personal importance.

Personal Importance: Do We Really Need Another Construct?

In the present essay, personal importance is construed as a quality of the phenomenological relationship between a cognizing subject and the object of his or her cognitive processes, whether these processes be in the modes of perception, imagination, judgment, or memory. Thus, in language drawn from the philosophic tradition of phenomenology (Husserl, 1913/1962; Kohak, 1978), personal importance is not a "thing" in the mind that imposes meaning upon the object; nor is it an "objective" quality of events or things in the world. Rather, it is a quality of the "experience" between a subject and object which simultaneously "constitutes" (Husserl, 1913/1962) the subject as an "importance- experiencer" and the object as "important-to-an-experiencer."

In terms of psychological qualities, the experience of personal importance is characterized by strong evaluative emotion evoked by an object of attention or awareness. Thus, when the object of awareness is social behavior, the experience of importance is characterized by strong evaluative emotion in response to particular types of interpersonal events and actions. Both the autobiographical memory literature, to be reviewed shortly, and the personal values literature (Rokeach, 1973, 1979) indicate emotional intensity to be a core

feature of personal importance. Work in the area of values further indicates that a person's sense of the importance of a behavior involves an evaluative component, that is, a sense that the behavior is good or bad, right or wrong (Rokeach, 1973, 1979).

There are both general and more specific ways in which the notion of personal importance represents a more valid and potentially more effective conceptual tool than either chronic accessibility or self-relevance with which to explore the relation between memory and individual differences in the salience of various social stimuli. On the general level, differences in levels of affective arousal have been shown to affect processing and recall (Bower, 1981; Fiske, 1980; McArthur & Baron, 1983; Zajonc, 1980). Several authors have noted that the study of cognition has largely avoided examining the inherent role of emotion and affective arousal in thought processes, and argue that valid representations of cognitive processes must incorporate the influences of affect (McArthur & Baron, 1983; Zajonc, 1980). The notion of personal importance, intimately tied as it is to the affective intensity of a person's response to behavior and events, thus represents an improvement upon the notions of chronic accessibility and personal relevance, neither of which explicitly incorporates affect in their theoretical rationales or in the methods developed to assess their effects.

More specifically, the notion of personal importance articulates and clarifies aspects of the relation between cognition and individual differences in the salience of stimuli that chronic accessibility and personal reference either imply or need to assume in order to work as

constructs. As regards chronic accessibility, although the concept does not explicitly address the role of affect, the theory of how constructs become accessible outlines conditions that must involve affect. As was noted above, researchers who work with the notion of chronic accessibility hold that the level of salience of a domain of behavior and its related construct directly and positively relate to the number of times the construct has been activated in the past (Higgins & King, 1981; Higgins, King, & Mavin, 1982; Shiffrin & Dumais, 1981; Shiffrin & Schneider, 1977; Wyer & Srull, 1981).

Higgins et al. (1982) continued:

Thus, to the extent that people's social experiences vary in respect to which constructs are frequently activated (e.g., long-term differences in socialization experiences, goals, etc.), one would expect there to be individual differences in construct accessibility. (p. 36)

What Higgins and colleagues failed to recognize explicitly is that socialization experiences are fraught with affect (Costanzo & Fraenkel, 1987; Hoffman, 1977, 1979, 1983; Hoffman & Saltzstein, 1967; Maccoby & Martin, 1983). Thus, the salience of a construct might be viewed as a joint product of the affective intensity of the social circumstances leading to its activation, as well as its frequency of activation. In other words, it is likely that what makes one construct more accessible than another is, not simply frequency of activation, but activation in an affectively charged interpersonal context. Bargh (1982) briefly spoke to this point when he noted that "the emotional quality of the self-relevant information may underlie its attentional effects, not its frequency in perceptual experience alone" (p. 434).

Affect is an unacknowledged component, not only in the theory of construct accessibility, but also in the methods used to assess chronic construct accessibility. Several researchers rely on the principle of primacy in identifying accessible and inaccessible constructs (Bargh, Bond, Lombardi, & Tota, 1986; Bargh & Pratto, 1985; Higgins, King, & Mavin, 1982). In these studies, accessible constructs were defined as those that came to mind first for subjects when asked to list the characteristics of the types of persons they liked, disliked, sought out, avoided, and frequently encountered. With the exception of the search category "frequently encountered," subjects in these studies were essentially asked to describe the attributes of persons whom they evaluated positively and negatively (i.e., persons about whom subjects have strong feelings). Moreover, Alexander (1988) has persuasively shown that information that has the characteristic of primacy in a person's self-description or in responses to questions about preferences and the like represents elements of strong emotional themes or "scripts" in the person's life.

Most tellingly, evaluative affect is shown to be an unacknowledged but active component of accessibility in Bargh et al.'s (1986) finding that subjects made more extreme evaluations of a vignette character who was portrayed in terms of accessible constructs than of one portrayed in terms of inaccessible constructs. In addition, Derry and Kuiper (1981) found that clinically depressed patients showed enhanced recall for adjectives that were depressed in content. The authors reasoned that depression involves greater accessibility of negative

versus positive constructs. These findings demonstrate that accessibility is intimately tied to affective experience.

Thus the theory, methods, and results of the literature on chronic accessibility tacitly acknowledge the role of affect in accessibility. The notion of personal importance improves upon that of accessibility in that it builds affective experience directly into theory and method.

In at least several cases, the theories and assessment methods of the chronic accessibility and self-relevance/self-reference literatures overlap (e.g., Markus, 1977), and the latter are thus open to the criticisms of the accessibility literature detailed above. However, in the case of the self-relevance/self-reference literature, the failure to stipulate a role for affective processes creates even more troublesome problems. Without an explicit role for affect, these theories do not specify the real-life conditions that would provoke self-referent processing, or that would lead the person to experience certain contents as self-relevant and others as irrelevant to self. That is, persons encounter daily a wide range of information and stimuli that can be construed as self-relevant; yet only a small portion of this information is likely to be stored and available at a later time. Moreover, by ignoring the affective component in self-referent processes, these theories implicitly assume that practically all information is equally likely to be processed in reference to self. However, it is probably more ecologically accurate to assume that persons initiate self-referent processes only when the information encountered is personally meaningful and important.

For example, during the course of a day a given person may encounter situations that respectively lead to increased salience of the constructs friendliness, politeness, achievement, competence, attractiveness, independence, responsibility, and neatness, among many others. All of these constructs, and the situations that evoke them, are on some level relevant to the person, as they are encountered in events that involve the person as a participant. In addition, persons' lives tend not to vary dramatically from day to day in respect to the kinds of behavior they exhibit and the situations they are likely to encounter. Thus, each day the person is likely to engage in behaviors and to be involved in situations that represent these domains, ostensibly resulting in a large number of constructs being consistently self-relevant over time.

Yet, though these constructs are all self-relevant, undoubtedly the person will not find each of these constructs equally salient and will not equally attend to, think about, and recall events in each of the different domains. One person may focus primarily on situations in which he acts independently or dependently; another may be attuned to personal achievement and failure. Information from these salient self-relevant events is then better remembered than information from less salient self-relevant domains.

Thus, some of these self-relevant constructs and their related events must be experienced as more important than others. It is these important, self-relevant constructs that will be more salient than other, relatively unimportant self-relevant constructs. In turn, those constructs that are found most important are likely to be those

for which the corresponding events have more emotional impact upon the person.

Put another way, a person might view a large number of constructs as self-descriptive, but will not view all of these constructs as definitional of self. For instance, a person may view the construct "polite" as self-relevant and self-descriptive, without considering politeness to capture much of his or her personality. Again, those constructs considered to be self-definitional are likely to hold a good degree of personal importance.

As with the methods used in the assessment of chronic accessibility, affect is implied but not explicitly incorporated in the methods used to discriminate self-relevant from nonrelevant constructs. Self-relevance has primarily been assessed by having subjects indicate whether or not trait terms are self-descriptive (Markus, 1977; Markus & Sentis, 1982). However, this assessment approach sheds little light on the psychological processes involved in the individual's experience of self-relevance, that is, the internal cues persons actually employ to distinguish self-relevant from irrelevant information, or that automatically initiate self-referent processing. Moreover, it is difficult to imagine that persons do not have various degrees of feeling about those constructs that they deem self-descriptive versus those they do not find self-descriptive, or that they do not have degrees of positive or negative feeling about the fact that they perceive themselves as instantiating these constructs.

A more selective, ecologically accurate approach to assessing self-relevance would involve determining the strength or degree of experienced self-relevance. Such intensity dimensions may best be operationalized in terms of emotional intensity. Even if not construed in terms of emotional intensity, it is likely that strength of emotional reaction to the stimuli under assessment will underlie other means of describing the strength of the self's involvement with these stimuli.

For instance, a scale that asked persons to rate the degree to which they would describe themselves in terms of various constructs to a prospective employer or mate, or a scale that asked persons to rate the degree to which important others would describe them in terms of these constructs, would undoubtedly stimulate affective responses in the questionnaire respondent. These affective responses are likely to play a central role in the manner in which persons endorse items on the scale.

In light of the above critique, results obtained in studies on the memory-enhancing effects of self-reference, even when supportive of the relation between self-referent processing and recall, may have little to say about the ways in which persons actually differentiate, encode, and recall information. By failing explicitly to incorporate affective processes in theory and assessment, researchers working in the self-reference/self-relevance tradition may overlook the crucial factor that distinguishes between important self-relevant constructs and unimportant self-relevant constructs.

In contrast, the notion of personal importance holds that certain information generates a stronger affective response and so commands more attention, promotes more thorough encoding, and results in better recall than other, less important, less emotionally involving information. Thus, the notion of personal importance may address the real-life phenomenon of interest to researchers in the areas of self-reference and self-relevance, but in a way that more closely resembles real-life conditions.

In summary, the notion of personal importance appears to improve upon the existing constructs used in exploring the relation between long-term individual differences in the salience of various sorts of information and memory for this information. To summarize, these improvements include two key points: First, whereas the theories and methods of chronic accessibility and self-reference imply or beg the question of the role of evaluative emotion, the concept of personal importance explicitly articulates and incorporates the role played by evaluative emotion in differentiating salient from nonsalient domains of behavior. Second, unlike the notions of chronic accessibility and self-relevance, the notion of personal importance acknowledges the possibility that the experienced intensity of socialization encounters may play as central a role in differentiating salient from nonsalient domains as does simple frequency of encounter.

Thus, in answer to the question proposed in the title of this chapter, it appears that we do need another construct with which to explore the relationship between personal experience and memory;

moreover, the construct of personal importance promises to be useful in this exploration.

The essay will now turn to a review of the literature on autobiographical memory, with a focus on the issue of the ways in which personal importance may play a part in determining the particular qualities of memories of the events in one's life.

CHAPTER II

PERSONAL IMPORTANCE AND AUTOBIOGRAPHICAL MEMORY

Introduction

Although memory researchers have not conclusively delimited the term autobiographical memory (Brewer, 1986; Rubin, 1986), all would agree that autobiographical memories involve recollections of personal events or life experiences (Brewer, 1986; Robinson, 1986).

Autobiographical memories thus constitute the basis of one's personal history and so are intimately tied to one's sense of self (Barclay, 1986; Rubin, 1986; Wagenaar, 1986). As Linton (1986) has noted, "In a sense we are the memories we access" (p.66). Likewise, one's ongoing sense of self and of what is important in one's world is likely to affect the range and content of one's autobiographical memories (Brewer, 1986). Again, Linton (1986) has noted the "interactive nature of memory and personality . . . manifest by the particular items that persist in reentering consciousness, given the skimpiest of cues" (p. 65).

Given this interactive relationship, it may be supposed that the autobiographical memories a person recalls in personally relevant or important behavior domains are likely to differ on a number of dimensions from those recalled in domains of little personal importance. The present study seeks to explore how autobiographical memories that represent events in domains of personal importance

differ from autobiographical memories that represent events in domains of little personal importance.

Past Research in Autobiographical Memory

Although psychotherapists have long been interested in autobiographical memories (Breuer & Freud, 1893/1955), and some of memory's earliest scientific investigators conducted beginning forays into the realm of personal recollections (Colgrove, 1899; Galton, 1883), only recently has autobiographical memory been systematically investigated. Brewer (1986) has remarked that the field of autobiographical memory is still largely at the stage of developing methods of approaching its phenomena of interest. Not surprisingly, much of the work done to date has been in great part descriptive rather than experimental. Linton (1986) has argued that much like the ethologist who enters a new environment to study its inhabitants, autobiographical memory researchers must first come to know the numbers and types of past personal experiences contained in memory.

Appropriately, much attention has been given to quantitative descriptions of autobiographical memories, such as retention functions (Croovitz & Quina-Holland, 1976; Crovitz & Schiffman, 1974; Franklin & Holding, 1977; Rubin, 1982; Rubin, Wetzler, & Nebes, 1986; Wetzler & Sweeney, 1986). In addition, several experimental studies have been conducted on the accessibility (i.e., whether or not an event can be recalled) and availability (i.e., the ease with which a memory is recalled) of personal memories (Linton, 1975, 1978, 1982, 1986; Fitzgerald & Lawrence, 1984; Robinson, 1976, 1980; Wagenaar, 1986;

White, 1982). A few researchers have explored the relations between recallability of memories and particular qualities of memory cues, qualities of memories, and qualities of the remembered events themselves. Prominent among the qualities or factors researchers have examined is level of personal importance, as well as factors that may have some relation to importance, such as affect valence (i.e., positive versus negative) and emotional intensity, event distinctiveness or rarity, and frequency of rehearsal. The work of these researchers will be briefly described.

Linton (1975, 1978, 1982, 1986), White (1982), and Wagenaar (1986) have each conducted studies of their own memories over relatively long periods of time. Each researcher provides data that illustrate the effects of an event's emotionality, distinctiveness, and importance on recallability. The experimenters' use of a single subject design with themselves as sole subjects poses certain methodological difficulties and may limit the generalizability of their respective findings. However, their reports offer a rare glimpse of the characteristics of memory for events recalled over extended periods, the study of which would be difficult to conduct using persons other than the experimenter him/herself (Linton, 1975; Wagenaar, 1986).

In an ongoing study that began in 1972, Linton has briefly recorded two events each day and then has rated the emotional intensity, distinguishability, and importance of the events. Her main recall task requires her to select event cards randomly two at a time

and to date and temporally order the events. Events she cannot recall she eliminates from the active file. In her 10-year report (Linton, 1982), she indicated that ratings of emotionality and importance did not appear to correlate with recallability of events. Linton noted further that ratings of the emotionality of an event at the time of the event and at the time of the recall test were often not related. Linton also described the relationship between importance and emotionality: Important, unique events received the highest emotionality ratings.

Although event emotionality and importance did not appear related to recall for memories of events up to 10 years old, Linton did find item distinctiveness--the event's distinguishability from other life events--highly related to later recallability. In 1982, then, Linton suggested that, in order for an important, emotional event to be recalled after relatively long periods, the event must also be regarded as a turning point--the beginning or end of an event sequence--and the event must be seen as fairly unique.

However, in her most recent article, Linton (1986) reported a more direct role for importance and emotionality in event recallability. In this report, Linton described the results of the free recall component of her monthly memory test--in which she "warms up" for her dating and ordering test by attempting to recall all the events of the previous year--along with two separate free recall experiments, one in which she recalled events from randomly chosen periods of 1 month from the preceding 6 years, and one in which she

recalled events from randomly chosen years. Data from these three experiments indicate that an event's "salience," defined by Linton as the event's importance, emotionality, and frequency of rehearsal, directly relates to recallability, especially for older memories.

Although these data indicate that importance and emotionality play a greater role in recall than Linton reported earlier (Linton, 1982), she reiterated that an important, emotional past event must continue to be relevant to one's life in order to be recalled. An event's initial emotionality or experienced importance may become dimmed over time--either due to contrast effects resulting from experiencing more emotional, important events, or to repetition of similar events, or to changes in perspective on the past. Such an event often cannot be easily recalled, despite its initial salience.

White's (1982) results essentially corroborate those of Linton's regarding the effects of event rarity, emotionality, and importance on recall. Additionally, White provided some information on the role of vividness in memory availability. White found that memories of events initially rated low in frequency, or high in vividness, or high in emotional intensity were the most retrievable, and found further that rarity and vividness played the largest role in memory availability. He noted that on no occasion did he forget events rated as both rare and vivid. White's data further indicated that the role of emotional intensity in memory recallability is in contributing to event vividness.

White found that the perceived importance of an event at the time it occurred did not necessarily affect recallability. However, importance was moderately correlated with memory vividness. Thus, according to White, events that are of sufficient uniqueness to avoid the memory-debilitating effects of interference by recollections of similar events, and events that are highly vivid, are those most likely to be recalled. The emotional intensity of the event, and to a lesser extent the event's importance, contribute to recallability only indirectly, by affecting the vividness of an event. White noted, "The results imply that for an event to be stored for any considerable period the observer has to be able to discriminate it from other events and must be affected sufficiently by its characteristics to want to process it" (p. 182).

Wagenaar's (1986) study of his autobiographical memory over a 6-year period focused largely on the relative effectiveness of various memory cues. Wagenaar's records of daily events specified the who, what, where, and when components of each event; in his memory tests, he used various combinations of these components to cue memory of the other components of the event.

However, Wagenaar (1986) also explored the effects of event saliency, emotional involvement, emotional intensity, and pleasantness on recallability. Wagenaar's operationalization of saliency was essentially equivalent to Linton's (1975) "distinguishability" and White's (1982) "rarity" and represented the relative frequency of an event in his life. Wagenaar's scale of emotional involvement ranged

from neutral to extreme and essentially described the affective salience of events, as well as the intensity of experienced affect. He used his pleasantness scale to identify both affective valence and affective intensity.

Wagenaar (1986) found salience, emotional involvement, and emotional intensity (on the pleasantness scale) significantly related to one another, but found emotional valence unrelated to these three dimensions. All four dimensions, including pleasantness, were significantly and positively correlated with event recallability.

In regard to the positive effect of event pleasantness on memory, Wagenaar noted that whereas his pool of events included more pleasant than unpleasant events, pleasant and unpleasant events were equivalent in terms of judged salience and emotional involvement: Thus, Wagenaar argued that his poorer recall for unpleasant events relative to pleasant events might have been due to memory "suppression" as described by psychoanalytic theory. His argument is buttressed by the finding that the differences between recallability of pleasant and unpleasant events was greatest for events recalled a year after they occurred, while the memories were still relatively "hot"; as events grew more distant, pleasant and unpleasant events differed less in recallability.

Although Wagenaar may be correct in his interpretation of the effect of pleasantness, he did not discuss the possibility that differences between pleasant and unpleasant memories were due to the

memory-enhancing effect of pleasantness, rather than the memory-diminishing effect of unpleasantness. His data lend support to such an alternative interpretation, in that unpleasant events were as well recalled as neutral events. Pleasant events were better recalled than both neutral and unpleasant events.

Overall, Wagenaar (1986) concluded that the more salient, emotionally involving, emotionally intense, and pleasant an event, the more thoroughly it will be recalled. In addition, Wagenaar argued that salient, emotionally involving events are better retained because they generally have more "sequelae" than do less salient, involving events, and thus are more frequently rehearsed.

Although Wagenaar (1986) did not directly examine the effects of importance on memory, two of the three dimensions he found empirically related--namely, emotional involvement and emotional intensity--constitute central aspects of the notion of personal importance. Their empirical clustering, and their positive relation to recallability, provide further indication of the possible role of importance in autobiographical memory.

In addition, Wagenaar's (1986) eloquent notion of the more extensive sequelae or "ripples" which result from salient, involving events may apply to the memorial effects of personal importance. It may be that events in personally important domains will be more memorable than events in unimportant domains because events in important domains are more likely to result in more extensive and noteworthy related subsequent events or life conditions than are

unimportant events. In essence, there may be more continuity between the person's past and present in important domains than in unimportant domains and thus a greater likelihood of rehearsing and recalling past events.

Several researchers have utilized more traditional, nomothetic designs to study the relation between the qualities of events, cues, or memories and the recallability of life events. Robinson (1976) examined the differences in the accessibility of memories cued by positively and negatively valent affect words as opposed to nonaffect words. Robinson found that subjects took longer to recall affect-prompted personal memories than memories cued by words that described objects or activities. Affect cues produced more recent memories than nonaffect cues, though there was no difference in the age of the memories obtained from positive versus negative affects. Robinson noted that all of the memories subjects produced included some reference to the affect experienced during the event, whether or not the memory was cued by affect words. Robinson suggested that most autobiographical memories involve some degree of affect.

In a later study, Robinson (1980) sought to discern the relative impact on accessibility of the valence of affect versus the intensity of affect felt about the events recalled. Robinson found that both retrospective reports of the intensity of the emotion experienced at the time of the original event, and reports of the intensity of the emotion experienced at the time of recalling the event, were inversely related to accessibility as measured by speed of recall, with higher

intensity resulting in quicker recall. However, relative pleasantness of the remembered event was found unrelated to accessibility.

Robinson replicated these findings in two further studies designed to control for possible confounds. In these two studies he used only the measure of estimated original emotional intensity, which he argued more validly represents the person's feelings about the event at the time it occurred.

Robinson concluded that the intensity of emotion experienced about a personal event positively affects the relative accessibility of the memory of the event, whereas the valence of the emotion experienced does not affect accessibility. Robinson further noted that emotional intensity may relate to importance, as "feelings are one indication of the personal significance of events" (p. 170). Thus, to the degree that an event or memory's relative level of personal importance involves correlative levels of experienced affective intensity, Robinson's studies provide some beginning indication that memories in important domains may differ from memories in unimportant domains.

Rubin and Kozin's (1984) investigation centered on description of the characteristics of vivid memories. Their study included two parts. In Part I, subjects produced their three most vivid memories and then rated these on several scales corresponding to a number of qualities of memories and events: personal, national, and general importance, consequentiality, surprise, degree to which the event led to a change in activity and to change in emotion, frequency of

rehearsal, and event likelihood. Subjects also dated the events recalled. In Part II, subjects were given 20 cues previously found to bring up vivid memories for some persons but not others. Subjects were asked to produce one memory for each cue, to judge whether or not the memory was vivid, and to rate each in terms of memory qualities.

The results of Part I indicated that of all the qualities examined, only personal and general importance (essentially the same scale) were highly related to vividness. Vivid memories varied from high to low on all other dimensions. In addition, Rubin and Kozin found that vivid memories have a shallower retention function than would be expected for autobiographical memories as a group, indicating that older vivid memories are more likely to be recalled than are nonvivid memories of the same age.

The results of Part II indicated that, along with being seen as more personally important, vivid memories and the events they represent are experienced as more frequently rehearsed, more surprising, more consequential, and more likely to involve a change in emotion than are nonvivid memories. Rubin and Kozin concluded that, whereas higher levels of surprise, consequentiality, emotionality, and rehearsal are "associated" with higher memory vividness, they are not necessary qualities of vivid memories: The personal importance of an event is the only quality that clearly differentiates vivid from nonvivid memories.

Fitzgerald (1986) sampled vivid memories of persons ranging in age from early to late adulthood in an attempt to identify the

qualities of highly available memories. Previous studies (see Rubin, Wetzler, & Nebes, 1986) had found that a larger than expected proportion of events remembered by older adults derive from the period of youth and young adulthood. Fitzgerald hypothesized that memories of events from the period of 11 to 30 years of age might be more available because they are more vivid, and that they are more vivid because they are more personally important, than are memories from later periods in life.

Fitzgerald used the same procedure as employed by Rubin and Kozin (1984) in Part I of their study. Fitzgerald's data replicated Rubin and Kozin's (1984) finding that personal importance was highly related to memory vividness; Fitzgerald noted that the relationship held between personal importance and memory vividness regardless of the subject's age. Though not quite as clear as the overlap between importance and vividness, Fitzgerald also found emotional intensity related to memory vividness: Subjects recalled experiencing intense emotions during events that were later vividly remembered. The degree of surprise associated with an event was also found related to memory vividness. Fitzgerald did not find the valence of experienced emotion related to vividness.

Fitzgerald's study thus replicates a number of the findings of Rubin and Kozin (1984): The class of highly vivid personal memories appears to overlap greatly with the class of personally important events, and emotional intensity and surprise are characteristic but not necessary qualities of vivid memories.

Fitzgerald's data also supported his major hypothesis: For middle-aged and older adults, a larger than expected proportion of vivid memories were of events that occurred during the period of late childhood through young adulthood. Fitzgerald explained his findings by arguing that the period of 11 to 30 is a time in life when a number of events usually occur that persons later construe as being of great personal importance, and that the memories of these events come to be retold and recollected frequently, as they constitute the "core" of the individual's personal history. The more frequently the memories are rehearsed through retelling or recollecting, the more likely they are to remain vivid. Thus, the personal importance of an event or of the memory of an event affects its status in the system of autobiographical memories that constitute an individual's sense of self as viewed over time.

Summary and Critique of Past Research on the Role of Personal Importance in Autobiographical Memory

Studies that have directly examined the relation between personal importance and recallability of autobiographical memories have mainly supported the notion that personal importance influences recallability (Fitzgerald, 1986; Linton, 1982, 1986; Rubin & Kozin, 1984). In addition, emotional intensity and emotional involvement, which may contribute to or even largely define personal importance, have been found related to recallability (Fitzgerald, 1986; Linton, 1982, 1986; Robinson, 1980; Rubin & Kozin, 1984; Wagenaar, 1986; White, 1982). Frequency of rehearsal, which may be viewed either as a result or

precondition of an event's perceived degree of importance (Fitzgerald, 1986), has also been found associated with recallability (Linton, 1986; Rubin & Kozin, 1984). And the salience, rarity, distinguishability, surprisingness, or relative frequency of occurrence of an event--qualities that may also bear a strong relationship to personal importance--have been found highly associated with recall, with relatively salient, infrequent, rare, surprising, or distinguishable events being better recalled than relatively nonsalient, frequent, commonplace, or confusable events (Linton, 1982, 1986; Rubin & Kozin, 1984; Wagenaar, 1986; White, 1982).

Despite strong support for the notion of a relation between personal importance and recall of personal events, some studies have not borne out this relationship (White, 1982), or have indicated that the relationship is far from invariable or straightforward (Linton, 1982, 1986). The effects of the other, importance-related variables are also usually qualified (Fitzgerald, 1986; Linton, 1982, 1986; Rubin & Kozin, 1984; White, 1982).

Overall, however, given the small number of studies conducted thus far and the diversity in methods employed by these studies, the evidence for the relation between personal importance and memory for personal events is impressive. Discrepancies in obtained results may be due to a number of differences in the concepts and operations utilized by each researcher. Most crucially, researchers have differed in their operationalizations of memory recall and in their definitions of an autobiographical event and of importance. Below is

a summary of the discrepancies in these researchers' usage and operationalizations of these concepts.

Recallability

Some researchers operationalized recallability as availability (Linton, 1978, 1982, 1986; Wagenaar, 1986; White, 1982), some as accessibility (Robinson, 1976, 1980), and some as vividness (Fitzgerald, 1986; Rubin & Kozin, 1984). Some examined two or more of these types of recallability, or included special tests of recall such as the ability to date or order events (Linton, 1975, 1978, 1982, 1986; White, 1982), and it is not always clear which type of recall a researcher has referred to when stating results and conclusions. In addition, some researchers employed fairly subjective criteria for evaluating the quantity and quality of recall (Fitzgerald, 1986; Linton, 1982, 1986; Rubin & Kozin, 1984), whereas others specified more objective criteria (Robinson, 1976, 1980; Wagenaar, 1986). Thus, it may be that discrepancies in findings on the effects of personal importance and other importance-related determinants of autobiographical memory are due to the different sorts of recallability tested.

Definition of Autobiographical Events

Linton (1975, 1978, 1982) and Neisser (1986) have noted the conceptual problem of determining the level of generality and detail that constitutes an "event" and the procedural problem of specifying the level of detail to be used in recording events for later memory

cueing. Linton (1982) noted that findings about the recallability of personal events are confounded by the nature of the cues used to prompt recall.

The same problem exists for studies that do not involve cueing recall with records of events but, rather, descriptive ratings of memories retrieved to fit specific experimental conditions such as vividness versus nonvividness (Fitzgerald, 1986; Rubin & Kozin, 1984): Experimenters must determine the level of detail with which subjects probe their memories, and the level of detail of notes subjects take on the memories they produce and later rate. However, with the exception of Wagenaar's (1986) research, none of the studies described above strictly required certain features of events to be systematically recorded (e.g., answers to the questions of the who, what, when, where, why, and how's of the event); nor did any of the studies, including Wagenaar's, include both upper and lower limits on the number of words or lines used to record events or memories.

In addition, studies varied in terms of the degree of uniqueness required of a life event in order for it to be included for later examination. For instance, White (1982) attempted to select events in a random fashion with no regard to item distinctiveness; Linton (1975) and Wagenaar (1986), on the other hand, only included events that were, in Wagenaar's (1986) terms, "unique and fully distinguishable" from previous events.

Thus, given the obtained effect of event distinctiveness on memory, some of the discrepancies in findings reported in the current

literature may derive from experimenters' use of essentially qualitatively different sets of stimuli in their respective studies. More specifically, to the extent that event importance bears some relationship to event distinguishability, Linton's (1975) and Wagenaar's (1986) inclusion of only fully distinguishable events may have resulted in a floor effect in regard to variations in importance. On the other hand, White's random selection of events may have resulted in an insufficient sampling of high versus low importance events, limiting the possibility of importance effects.

Definition and Operationalization of Importance

Fitzgerald (1986) noted the variability across studies and the vagueness within studies of the definition of importance. In the studies reviewed above, only Linton (1975) and White (1982) explicitly defined importance--for both, an event's importance refers to the degree to which the event relates to "perceived steps toward life goals, both personal and professional" (Linton, 1975, p. 350). Fitzgerald (1986) and Rubin and Kozin (1984) tacitly distinguished "personal" from "national" importance, but did not inform their subjects as to the specific meaning of personal importance. Nor did they distinguish personal importance from the related concept of consequentiality, which they included as another rating dimension. None of the researchers distinguished between personal importance and emotional intensity--a distinction that seems necessary, given the relation between how strongly persons feel about an actual or

remembered event and the degree to which they view the event as important (Robinson, 1980).

The lack of clear and consistent definitions of importance in the current body of literature may have allowed subjects in different studies to use different internal cues or assessment strategies in evaluating importance. Subjects within studies may even have used different internal cues in assessing the importance of different sorts of memories. As was indicated in the foregoing review, the literature provides data and arguments that support the proposition that, not only emotional intensity and consequentiality, but also frequency of rehearsal (Fitzgerald, 1986; Linton, 1982; Rubin & Kozin, 1986; Wagenaar, 1986), change in activity (Rubin & Kozin, 1984), event uniqueness or rarity (Linton, 1982; Wagenaar, 1986; White, 1982), membership or place in an event sequence (Linton, 1982; Wagenaar, 1986), centrality of an event in the "network" of a person's autobiographical memories (Fitzgerald, 1986), and vividness (Fitzgerald, 1986; Rubin & Kozin, 1984; White, 1982) all may relate or contribute to an event or memory's experienced importance. Thus, any one or more of these factors and processes may constitute internal cues for the individual when he or she assesses the relative importance of a remembered event. Therefore, it is imperative that researchers specify the cues they wish their subjects to employ when judging importance. The failure of contemporary researchers to do so may have contributed to variability across studies in findings regarding the relation of importance to recallability. Additionally,

even stronger, more interpretable findings than those currently reported might be obtained if subjects were instructed to employ specific internal cues in evaluating importance.

Another way in which the researchers differed in their assessment of importance, as well as in their manner of assessing emotional intensity, was in whether subjects were asked to rate the importance or emotional intensity of an event shortly after it occurred (Linton, 1975; Wagenaar, 1986; White, 1982), to rate the importance or intensity of the event retrospectively as experienced at the time it occurred (Fitzgerald, 1986; Robinson, 1980; Rubin & Kozin, 1984), or as experienced at the time of recall (Robinson, 1980). As Robinson (1980) and Linton (1982, 1986) noted, the perceived importance and intensity of an event may change over time: Thus, the temporal frame used in assessing importance and intensity likely affects findings regarding the relationship of these variables to other qualitative or quantitative aspects of memory. Discrepancies in the findings of the current literature may be due in part to differences in the temporal frame used in assessing the importance and intensity of events.

In addition to a lack of consistency in the usage and operationalization of key concepts, there are several other problems with one or more of the above described studies that limit their informativeness. These problems are described below.

Confounding Vividness with Importance

Studies that have demonstrated a relationship between personal importance and memory vividness (Fitzgerald, 1986; Rubin & Kozin,

1984) may have confounded vividness with importance. As was noted above, the relative vividness of a memory may act as an internal cue in evaluating the importance of a past event. Tversky and Kahnemann (1973) have shown that the relative availability or ease of recalling instances of a stimulus event influences judgments about those instances. Vividness, as a determinant of availability (Nisbett & Ross, 1980), may thus influence judgments of autobiographical instances, including judgments of the importance of those instances. In order to clarify the relationship between importance and vividness, the importance of the events that constitute the memorial stimuli and the vividness of memories of these stimuli needs to be assessed independently. Events or domains of events need first to be evaluated in terms of their importance, with the relative vividness of memories of these events assessed in a later, ostensibly unrelated part of the study.

Exclusive Focus on General Recallability

The current literature's exclusive focus on factors that affect general recall of life events leaves a number of equally interesting issues unexamined. Two such issues will be mentioned here.

Preemption and selective recall. First, the literature has not addressed the ways in which factors such as importance, salience, emotional intensity, and pleasantness may lead to systematic differences in the types of event features recalled. In other words, certain qualities of the person's experience of life events may affect not only how well the person recalls the events in some global sense,

but also may affect which aspects of an event are more or less well recalled. Wagenaar's interest in the possible operation of "suppression" in leading to relatively fewer memories of negative than positive events represents a step in this direction. It is suggested here that in addition to differential recall of whole events that differ in emotional tone, persons may exhibit differential recall of certain features within events.

For instance, certain factors may affect the relative proportion of information recalled about the intentions versus the outcomes of a person's own past behavior. In the area of social perception, Costanzo and his colleagues (Costanzo & Dix, 1983; Costanzo & Fraenkel, 1985, 1987; Costanzo & Woody, 1985) have argued that negative emotional arousal experienced by a person perceiving negative or undesirable behavior in an important domain may "preempt" perception and encoding of certain details of the observed behavior. The notion of preemption indicates that perceivers who are negatively aroused by observing an important behavior tend to attend more to the nature of the outcomes of the behavior or event than to the actor's motives and intentions, the mitigating circumstances, or other subjective information that might moderate the culpability of the actor.

Preemptive processes, by affecting attention and encoding, may affect memory for events, including important autobiographical events. In addition, preemption may operate in retrieval processes. Whatever

the specific mechanism of influence, persons may remember more about the outcomes than the intentions of their behavior when this behavior violates an important domain; they may remember a more equal proportion of information about intentions and outcomes when the behavior recalled represents an exemplification of an important domain. Preemption should not occur in the recall of unimportant behavior, because such behavior by definition does not evoke the intense emotion that would serve to preempt encoding or recall.

Autobiographical memory and self-perception. Despite agreement within the field on the intimate relationship between autobiographical memory and the person's sense of self (Barclay, 1986; Fitzgerald, 1986; Linton, 1986; Mancuso & Ceely, 1980; Rubin, 1986; Wagenaar, 1986), no studies published to date have directly examined the memorial features that affect which autobiographical memories a person finds more or less self-descriptive. As was argued in the previous chapter, given the countless events in which a person participates even in a relatively short time span, some selection must occur when a person reflects back on the store of memories and settles on those that represent himself or herself most or least well. Research needs to address the undoubtedly complex relation between the self and memory empirically.

Overview of the Present Study: Goals, Method, and Predictions

The present study examines the ways in which autobiographical memories representing events in personally important domains of

behavior differ from autobiographical memories representing events in unimportant domains. The study also takes an initial look at the possible role of preemption in autobiographical memory and seeks to identify the role of importance in determining the relation between autobiographical memory and self-perception.

More broadly, the present study is concerned with individual differences in autobiographical memory--domain importance being one factor that varies between persons. Methodologically, the study combines the strengths of an idiographic approach--where the contents examined in memory tasks are meaningful to the individual examined--with the strengths of a nomothetic approach, where results have greater generalizability. To this effect, domains of importance and relative unimportance are preselected for individual subjects through their responses to an assessment instrument. Words representing these domains then become the stimuli used to elicit autobiographical memories, in a procedure modeled after Crovitz and Schiffman (1974) and Robinson (1980). Subjects then rate and rank their memories on a wide variety of descriptive dimensions. With this design, the data obtained can potentially lead to general conclusions about the role of importance in autobiographical memory, while respecting individual differences in what persons find to be of high and low importance.

In addition to manipulating level of domain importance, the present study manipulates the affective valence of the behavior recalled, as well as the relative distinctiveness or "novelty" of the behavior recalled. Thus, subjects are asked to recall relatively

commonplace important and unimportant positive and negative behaviors, as well as relatively rare behaviors of high or low importance and positive or negative valence. Relative event novelty is included as a variable in the study because of the consistent evidence that rarity, distinctiveness or distinguishability affects memory for life events (Linton, 1982, 1986; Rubin & Kozin, 1984; Wagenaar, 1986; White, 1982). As was discussed above, event novelty may relate to event or memory importance; the precise relationship between these features needs to be identified. And although the findings are more mixed concerning the effects of affective valence on autobiographical memory (Fitzgerald, 1986; Robinson, 1980; Wagenaar, 1986), these effects may emerge as more orderly if they are explored alongside those of domain importance. That is, it is possible that domain importance and affective valence interact in their effects on autobiographical memory; the present study is designed so as to allow this potential interaction to emerge.

In the present study, the personal importance of a behavior domain is defined as the intensity of evaluative emotion one experiences in response to one's own positive and negative behavior in the domain. In the assessment procedure, subjects are presented with a set of behavior domains. They are asked to imagine themselves acting in the ways described by words that represent the positive and negative poles of each domain; they then rate and rank each domain in terms of the intensity of positive and negative affect they would experience if they were to behave in the ways described. Positive and

negative affect are operationalized by clusters of emotions that have an evaluative tone to them: "good" (defined as proud, pleased, and so on) and "bad" (defined as ashamed, embarrassed, and so on).

The autobiographical literature supports the present definition of importance. As was indicated in the foregoing review, importance is found to be intimately related to emotional intensity and involvement (Fitzgerald, 1986; Linton, 1982, 1986; Robinson, 1980; Rubin & Kozin, 1984; Wagenaar, 1986; White, 1982). Furthermore, as was discussed in the first chapter of this essay, the values literature (Rokeach, 1973, 1979) indicates that the individual's assessment of the importance of a behavior intrinsically involves evaluation of that behavior. This evaluative component is concretely manifested largely by the nature of the affects experienced in response to a behavior. Thus, the present study's operationalization of personal importance as subjects' ratings and rankings of the intensity of evaluative emotion they imagine or believe they would experience in response to their behavior in a domain appears to have both empirical and conceptual validity.

To summarize, the methodology of the present study improves upon past autobiographical memory studies in the following ways:

1. Whereas in previous studies the definition of personal importance was usually ambiguous and often left up to the individual subject, personal importance is clearly defined in the present study, and the operations used to assess high and low importance hew closely to the definition.

2. Because the personal importance of domains is preassessed with an instrument designed to operationalize a specific definition of importance, subjects are not left to use their own idiosyncratic criteria to specify high versus low importance events and memories.

3. The personal importance of domains is preassessed, and cueing of memories of events in high and low importance domains occurs in a session 8 weeks later. Subjects are led to believe that the memory experiment is unrelated to the assessment session. This separation of the assessment of domain importance from the memory experiment eliminates the possibility of confounding importance ratings with vividness ratings, or of confounding importance with other variables that might be used as internal cues of the relative importance of a remembered event.

4. Whereas previous studies either examined memories of only fairly distinctive events or selected events randomly in regard to distinctiveness, the present study includes event distinctiveness or novelty as an independent variable.

5. The design of the present study allows for an examination of possible interactions between event distinctiveness, event valence, and importance.

6. Most of the previously described studies took only one approach to the assessment of autobiographical recall. The present study utilizes a number of approaches to assess recall, including subjective reports of image vividness, emotional vividness, confidence of recall, remembered event complexity, and frequency of rehearsal, as

well as objective measurement of recall latency. In addition, subjects in the present study are asked to date the events represented by their memories; these dates allow for a preliminary examination of possible differences in the "age range" of events recalled in various conditions.

7. The present study places some restrictions on the types of event to be considered an autobiographical memory (to be described shortly), as well as on the length of the written record of the memory used as the basis for descriptive ratings and rankings.

The present study, largely exploratory in intent, examines the relationship between domain importance and a number of aspects and attributes of autobiographical memories, of the process of recalling autobiographical events, and of the recollected events. Given that the effects of the personal importance of behavior domains on autobiographical memory have not yet been systematically examined, and given the working hypothesis that personal importance is likely to affect a number of aspects of autobiographical memory, it was decided to include a relatively large number of dependent variables in the present study. These variables are listed in the next section, which describes methods.

It is hoped that this study will serve at least three worthwhile functions. First, it is hoped that the study will establish whether the personal importance of behavior domains generally has an impact on remembering events in those domains. Second, it is hoped that the study will demarcate the areas of autobiographical memory where such

effects occur and where they appear relatively absent. Third, it is hoped that the study will provide preliminary indications of the specific effects personal importance has on particular aspects and attributes of autobiographical memory. If the present study achieves these goals, it should serve to point out crucial directions for further, focused examination of the specific effects of personal importance on autobiographical memory.

It may be premature to offer specific predictions about how the various attributes of autobiographical memory will be affected by various combinations of importance, affect valence, and event novelty. A brief consideration of the possible interactive relations between the effects of importance, novelty, and affective valence on two attributes of central interest--namely, emotional and imagistic vividness--will illustrate the potential complexity of these relations. The foregoing review of the autobiographical memory literature, along with select findings from the broader memory and cognitive literatures, allows an outline of broad predictions about the effects of domain importance on emotional and imagistic vividness, as well as an indication of possible modifications of these effects by novelty and affect valence.

The Effects of Personal Importance on Emotional and Imagistic Vividness: Preliminary Predictions and Anticipated Complexities

In the present study, subjects were asked to indicate how clearly or vividly they recalled the emotions they experienced during remembered autobiographical events and how clear their images were of

these events. Emotional vividness corresponds roughly to the ratings of the intensity of emotions experienced at the time of recall that were utilized in previous studies (e.g., Robinson, 1980). Imagistic vividness corresponds to Rubin and Kozin's (1984) and Fitzgerald's (1986) notion of vividness.

As has been indicated, the autobiographical memory literature generally supports the prediction that memories of behavior in important domains will be more emotionally and imagistically vivid than memories of behavior in unimportant domains. Support for this prediction comes from other sources in the memory literature as well. One postulate of research on social knowledge is that "information is more apt to be retained in long-term memory if it has been processed more extensively (e.g., thought about more)" (Wyer, 1980, p. 561). Craik and Blankstein (1975) asserted that persons attend more to intensely arousing experiences than to less arousing experiences and encode more of their experience of an intensely arousing event. In addition, experiences that involve intense affect have been found to be more frequently rehearsed than are less arousing experiences (Menzies, 1935; Waters & Lepper, 1936); and, as Wagenaar (1986) hypothesized, such experiences are more likely to have important sequelae or "ripples" that lead the person to reflect on them repeatedly. Because behavior in important domains is by definition more intensely arousing than behavior in unimportant domains, important behavior is more likely to be thought about and remembered than is unimportant behavior.

Research that explores the effects of the accessibility of personal constructs on social perception and memory (Higgins, King, & Mavin, 1982; Srull & Wyer, 1979, 1980) provides an alternative, nonaffective explanation for why domain importance should affect memory vividness. As was described earlier, this research indicates that perceivers more readily recall stimulus information relevant to acutely or chronically activated social constructs than information unrelated to such constructs (Higgins, King, & Mavin, 1982; Srull & Wyer, 1979, 1980). When this finding and the personal constructs perspective are adapted to the current study, important behavior domains are likely to be thought about more frequently than unimportant domains; thus, words or constructs representing such domains are likely to be more accessible than words representing unimportant domains. Therefore, personal events occurring in important domains are likely to be recalled better than events in unimportant domains.

Thus, from both the notions that important domains are more emotionally arousing and provide more accessible constructs, memories of behavior in important domains should be more vivid than memories of behavior in unimportant domains.

However, the literature indicates that the effects of importance on vividness of recall are likely to be modified by the novelty and affective valence of events. Novel, distinctive, or extreme information receives greater attention (Fiske, 1980) and more extensive processing (Wyer, 1980) than does more commonplace

information. Distinctive information is remembered better than commonplace information, as distinctive information is less likely to be confused with similar events--a claim supported by the autobiographical memory literature (Linton, 1982, 1986; Rubin & Kozin, 1984; Wagenaar, 1986; White, 1982), as well as the memory literature in general (Gleitman, 1981).

Although the literature points to the memory-enhancing effects of event novelty, there may be a critical level of novelty beyond which an event becomes difficult to recall. A large body of research on the role of schemata in memory indicates that persons rarely directly recall the details of a sequence of behavior or of a social event (see Wyer, 1980). Rather, features of the event that fit an applicable schema are encoded by the schema as a unit. Aspects of the behavior that do not match a preexisting schema may be ignored during information acquisition or may fail to be encoded and so are forgotten (Wyer, 1980). Thus, if a behavior is so unusual that no schemata are available to encode it, the person may find the behavior difficult to recall.

Regarding the effects of affect valence, there is some evidence that negative and extremely positive events attract more attention than do commonplace positive or neutral events (Fiske, 1980; Woll & Martinez, 1982). Some authors have argued that persons may be differentially attuned to pleasant and unpleasant events (McArthur & Baron, 1983; Zajonc, 1980), responding more rapidly and attentively to unpleasant events (McArthur & Baron, 1983). Although these findings

and arguments would seem to indicate that unpleasant autobiographical events should be more extensively processed, more frequently rehearsed, and thus, more vividly recalled than commonplace pleasant events, the literature gives conflicting reports regarding the relative memorability of pleasant versus unpleasant stimuli and events (Baddeley, 1983; Hanawalt & Gebhardt, 1965; Holmes, 1970; Jersild, 1931; Kreitler & Kreitler, 1968; Lishman, 1974; Wagenaar, 1986; White, 1982).

Thus, although it is broadly predicted that memories of behavior from important domains will generally be experienced as more emotionally and imagistically vivid than memories of behavior from unimportant domains, event novelty and affect valence are likely to interact with importance in previously unexplored ways. In addition, the three independent factors may work together differently in their effects on emotional versus imagistic vividness. For instance, relatively novel, unpleasant events in important domains may be more emotionally vivid than memories of commonplace positive events in important domains, though not necessarily more emotionally vivid than unusual, important positive events. However, because it is expected that information about intentions and mitigating circumstances will be preempted in the case of memories of unusual, negative, important domain behavior, and because persons should have more adequate schemata to encode positive behavior (given that positive behavior is likely to occur more frequently than negative behavior for most persons), important positive behavior should be more imagistically

vivid than important negative behavior. Yet again, if event novelty, affect valence, or both wield more powerful effects on memory than does importance, relatively unimportant but rare (or unpleasant) events may be recalled as vividly as important events.

Thus, the relations between personal importance, affect valence, and event novelty are likely to be complex. It is hoped that the present study will shed light on the ways in which domain importance, event novelty, and affect valence interact in their effect on the emotional vividness, imagistic vividness, and other attributes of autobiographical memories.

Method

Subjects

The 44 subjects selected to participate in the autobiographical memory study were drawn from a subject pool of 324 middle to upper-middle class freshmen and sophomores enrolled in an introductory psychology course during the Spring of 1986. Of the 44 subjects, 25 were male and 19 were female.

Assessment of Independent Variable: High and Low Importance Domains

During group testing sessions, the original set of 324 undergraduates completed a questionnaire entitled "Feelings About Behavior" (see Appendix A). This questionnaire was adapted from the instrumental values portion of the Rokeach Values Survey, a widely used measure of personal values (see Rokeach, 1973, 1979 for reviews

of studies using this instrument). Costanzo and his colleagues (Costanzo & Fraenkel, 1987; Woody, 1981; Woody & Costanzo, 1985) successfully used the Rokeach to select high and low importance domains for their experiments on the role of values in social perception and moral judgment.

Although the present study utilizes the concept of personal importance rather than that of "values" per se, the Rokeach values instrument was selected because it includes a fairly comprehensive set of behavior domains. Moreover, the values listed in Rokeach's instrument are essentially descriptions of domains of behavior.

Rokeach's original instrument asked subjects to rank order the personal importance of 18 values. The Feelings About Behavior inventory differs from the original Rokeach instrument in the following two ways:

1. Valued behavior domains as bipolar dimensions. Whereas the Rokeach instrument includes only the positive pole of each value domain (e.g., responsible, independent), the present instrument also includes the related negative pole (irresponsible, dependent). In the present conception, valued domains are considered bipolar dimensions: The importance of a behavior domain is illustrated as much or even more by the person's response to violations in that domain as by his or her response to exemplifications. The present instrument included the same positive behavior terms as those utilized in the original Rokeach. The negative terms were derived from a standard book of antonyms (Webster's, 1973).

2. Ranking "values" versus feelings about behavior. Whereas Rokeach's measure explicitly named the 18 behavior descriptors as "values," and directly asked subjects to rank these values, the present instrument is designed to assess the relative importance of behavior domains by having subjects actually engage in the concrete psychological processes involved in experiencing a domain as important or relatively unimportant. In other words, Rokeach's instrument requires subjects to use their own internal criteria or definitions of "value" in making value rankings, whereas the present instrument directly represents the operationalization of the concept of personal importance. As was discussed earlier in reference to the problems with previous efforts to assess importance, persons may differ widely in the ways in which they define concepts such as personal importance or value, and may rely on different internal criteria in making judgments about a behavior's greater or lesser importance or value. Such potential differences between subjects only adds to the problems of validity inherent in self-report measures. To the extent that an instrument reduces or eliminates such variation, it gains greater validity and usefulness.

In addition, Rokeach's approach of directly asking subjects to rank the value or importance of various types of behavior may lead them away from their personal feelings about behaviors and towards their notions of social norms, resulting in responses based on abstract judgments rather than on concrete preferences. The present

adaptation of the instrument is designed to reduce the likelihood of responses based on social norms.

In order to assess the intensity of affect experienced about behavior in various domains, subjects were asked to imagine themselves acting in the way described by each value-behavior term, and to rate, on a Likert-type 7-point scale, how good (for positive terms) and bad (for negative terms) they would feel about their behavior in each domain. Feeling "good" was defined as "feelings like being proud, pleased, delighted, thrilled, satisfied, and happy." Feeling bad was defined as "feelings like being ashamed, guilty, concerned, anxious, upset, worried, and angry." After completing ratings for each behavior in turn, subjects ranked the 18 behaviors in terms of the intensity of positive (or negative) affect they would experience if they acted in the ways described. It was hoped that this approach to assessment would derive a more accurate, concrete portrait of a person's important and unimportant domains than the Rokeach instrument provides.

In order to control for contrast and order effects, half of the subjects in group testing responded to the list of positive terms first; half the group responded to the negative terms first.

Reliability and Stability of Value Rankings

The reliability of the original Rokeach Values Inventory has been estimated in the .70s, with a range of .65 to .80, as assessed over periods ranging from 3 to 12 weeks (Rokeach, 1973, 1979). In the

present study, an assessment of relatively long-term reliability was conducted. In fact, the 8-week delay between administrations of the instrument makes this more an assessment of the stability of domain importance rather than of instrument reliability per se. The assessment was conducted to provide assurance that subjects' domain profiles, as determined in the initial administration, reflected their domain profiles at the time of the autobiographical memory study 8 weeks later.

Fifty subjects were randomly selected from the original pool of 324 to participate. Domain importance rankings were recategorized in terms of whether they fell in the top (1-6), middle (7-12), or bottom (13-18) third of the rank order. Percentage agreement and kappa coefficients were derived to determine whether subjects consistently ranked a domain as being of high, medium, or low importance.

Percentage agreement in value rankings over the 8-week period ranged from 46 to 84%, with a mean of 60%. For 75% of the domains, kappa coefficients were significant, at least at the $p < .05$ level.

Importantly, when shifts across categories occurred, they were rarely shifts from high to low or low to high importance: Shifts from high to low and vice versa each accounted for only approximately 7% of the total number of shifts. The four other types of shifts (high to medium and vice versa, medium to low and vice versa) each accounted for at least 21% of the total number of domain importance shifts.

Across the entire sample and all 36 domains descriptors, there were 717 shifts in domain importance. Given that 10,800 shifts were

possible, this is a relatively small number--approximately 6% of the possible shifts.

Thus, subjects' rankings of the relative importance of behavior domains appeared to be relatively stable over the 8-week period. When shifts occurred, they were mostly to adjacent importance categories; relatively few shifts occurred from high to low importance and vice versa.

Selection of High and Low Importance Domains for Individual Subjects

High and low importance domains for each subject were selected following a procedure outlined by Woody and Costanzo (1985). A high importance domain was operationalized as one for which the subject assigned a rank of 1 through 6 to both the positive and negative poles of the domain (e.g., independent and dependent). A low importance domain was operationalized as one for which the subject assigned a ranking of 13 through 18 for both the positive and negative poles of the domain.

Of the 18 domains assessed, only 6 had roughly equal numbers of subjects endorse them as being of high or low importance. The remaining 12 values were either positively or negatively skewed for the group as a whole. For instance, many subjects endorsed the domain of honesty-dishonesty as important; few endorsed it as relatively unimportant. Likewise, most subjects ranked the domain of self-controlled-impulsive as unimportant; few ranked it as highly important. Only the 6 best distributed domains were utilized in the

present study. The domains utilized were those represented by the value terms broad-minded, cheerful, courageous, forgiving, independent, intelligent, and their respective opposites.

Selection of Subjects for Study

Only subjects for whom a high and a low importance domain could be found among the six best-distributed domains were asked to participate in the study. In addition, an attempt was made to select subjects so as to equally represent each of the possible combinations of two domains in the high and low importance conditions so as to equally represent males and females in each domain combination.

Assessment of Dependent Variables: Attributes and Aspects of Autobiographical Memories

Most of the attributes of the subjects' autobiographical memories were assessed through the use of an instrument entitled "Memory Descriptions" (Appendix A). This questionnaire asked the subject to use 7-point scales to rate memories on a variety of dimensions, 17 in all. Three scales assessed the presentness of autobiographical memories: image vividness, confidence of recall, and frequency of rehearsal. One scale addressed retrospective estimates of event complexity. Three scales assessed aspects of subjects' affective experience of personal memories and events: emotional vividness, memory pleasantness, and event desirability. The significance and impact scales assessed subjects' sense of the relative consequentiality of past life events. The novelty, expectancy, and likelihood scales assessed subjects' sense of the predictability and

relative frequency of past events. One scale looked at subjects' retrospective estimates of their control over past events. Another asked subjects to describe the degree to which past personal events were a function of their age at the time of the event.

Three scales were designed to explore the effect of domain importance on preemption in memory. The first of these asked subjects to rate the degree to which their memories focused on the outcomes of their behavior versus the intentions of the behavior. (The distinction between outcomes and intentions was explained in an introductory paragraph.) A second question asked subjects to rate the degree to which their intentions matched their outcomes in the event remembered. The third question asked subjects to rate how good or bad their intentions were in the event remembered.

The six key rating scales were also represented in a ranking format entitled "Memory Rankings" (see Appendix A). Only the six most important dimensions were included in the ranking measure, so as to prevent undue fatigue in the subjects. These key scales included imagistic and emotional vividness, pleasantness, event significance, frequency of rehearsal, and complexity. The rank format was included for two reasons: (a) in case ceiling or floor effects were found in ratings; and (b) so that a combined rating/ranking index could later be derived that would represent a more stable characterization of subjects' experience of their memories than would be provided by ratings or rankings alone.

The Memory Rankings instrument also included a task designed to explore the relationship between autobiographical memories and self-perception. Subjects were requested to rank order the eight memories they had provided in terms of how well these characterized or "captured" them in the present.

Two temporal aspects of autobiographical memory were also examined: memory dating and recall latency. Subjects' dating of memories allows for examination of the period of time in their lives from which events are being accessed; subjects' recall latencies allow for examination of the length of time it takes for subjects to access memories. Subjects' recollections of event dates were assessed by having them provide the day, month, and year of the event's occurrence. Recall latency was assessed by using a stopwatch to record the length of time between presentation of the memory cue word (see Procedure) and the subject's verbal signal that he or she had retrieved a memory. Latencies were recorded to the closest second.

Procedure

Presentation of Experimental Conditions

Each subject was presented with four value words, representing each of four conditions derived from the 2 x 2 variation of domain importance (high and low) by event valence (positive, or exemplification, versus negative, or violation). The order of condition presentation was systematically varied across subjects.

In addition to the four basic Importance x Valence conditions, subjects also experienced two "novelty" or uniqueness conditions: Subjects were asked to recall, for each value word, an event they considered relatively "commonplace" in their life, as well as an event that they considered relatively "rare or unusual." Each subject produced four memories in one of these novelty conditions before being presented with the second novelty condition.

Thus, each subject was exposed to a total of eight experimental conditions: Importance (high and low), Valence (positive and negative), and Novelty (commonplace and rare). As was noted, the order of presentation of the conditions was counterbalanced in 4 x 2 random orders across the sample.

Individual Versus Group Administration

A subset of subjects was seen individually in order to record response latencies to value words. Limits of time disallowed testing all subjects individually; thus, after enough subjects were seen individually to conduct valid statistical tests of response latencies, the remaining subjects were tested in small groups. Twenty-six subjects were seen individually; 18 subjects were seen in groups. The individual and group testing formats are described below.

Individual testing format. The experimenter read subjects the following set of instructions:

Today I will present you with a set of words which describe behaviors. I will present these words to you one at a time on cards. For each word, I would like you to recall an event in your life that relates to this word--a time when you behaved in this way. In addition, I would

like the event you recall to be one that you consider a relatively commonplace (unusual, or relatively rare) event in your life. This memory can come from any point in your life, from as far back as you can remember to as recently as today. I will be taking note of the length of time it takes you to come up with a memory, but do not feel rushed. Take as long as you need to come up with the memory. Tell me when you've "got" a memory by saying "OK"; then record the memory in writing (record form is shown to subject). After you record the memory, date it by the month, day, and year as best you can remember. Please use the first memory that comes to mind--the first one that comes to mind. All your responses are strictly confidential--no one will see this information besides me. We'll use these memories in a later part of the experiment, so make your notes clear enough to help you recall the memory.
(Subject then produced first four memories).

Now let's go back to these words and this time, I want you to recall an event that you consider a rather unusual or relatively rare (or relatively commonplace) event in your life.

Following these instructions, subjects were encouraged to ask questions. The experimenter then presented the subject with each of four value terms one at a time. For each word, the experimenter recorded recall latencies. As was indicated in the instructions, subjects recorded each memory on an answer sheet and dated the event remembered.

Group testing format. The procedure and verbal instructions for subjects tested in groups of 5 to 6 was essentially the same as that for the individually tested subjects. Packets of words were devised in a manner that allowed subjects to see and respond to only one word at a time. Subjects were told by the experimenter when to turn to the next word. Each group either received the commonplace or the rare condition first. No latencies were assessed for group-tested subjects.

After subjects produced all eight memories they were given eight copies of the Memory Descriptions instrument and were asked to fill one out for each memory in the order in which they produced the memories (i.e., the order of experimental conditions). After completing this task subjects completed the Memory Rankings inventory. Subjects were thanked and given credit.

Once all data were collected, subjects were given a written description of the experiment and an opportunity to ask the experimenter questions. In general, subjects appeared to be engaged by the experimental task. Most subjects understood the instructions on first explanation, therefore few procedural errors were made; those who did not grasp some portion of the instructions were corrected immediately. A small number of subjects failed to complete a portion of the ranking task, resulting in missing data for those particular scales.

Summary of Method and Procedure

Thus, the experiment involved the following steps:

1. Administering the Feelings About Behavior inventory to the 324 undergraduates in the subject pool.
2. Identifying high and low importance domains for all 324 subjects.
3. Determining the relatively "well-distributed" domains in the sample--those that roughly equal numbers of subjects endorsed as being of high and low importance.

4. Selecting subjects whose high and low importance domains included the six well-distributed domains, and representing each combination of two domains equally in the high-low conditions.

5. Presenting subjects with stimuli (behavior descriptors) representing combinations of the three experimental variables: Domain Importance (high and low) x Valence (positive and negative) x Novelty (commonplace and rare), deriving autobiographical memories for each condition, and obtaining subjects' ratings and rankings of memory qualities for all eight memories.

Results 1, 2, 3

The five-way (Domain Importance x Event Novelty x Event Valence x Test Format x Gender) mixed factorial analysis of variance yielded a number of significant main effects and interactions across the 20 dependent variables examined. In order to present these results clearly, the findings for the dependent variables have been arranged

¹A multivariate analysis was considered for the present study. However, given the large number of dependent variables included in the study, there were not enough subjects to conduct the analysis.

²Data used in analyses for each dependent variable involved either a combined rating-ranking index (for the six "key" variables, as described in the section on methods), rankings only (for self-descriptiveness of memories), or ratings only (all other variables). The ANOVA tables in Appendix B indicate the sources of the data for each analysis (e.g., combined rating-ranking index, rankings, or ratings).

³Missing data led to slight differences in the number of subjects included in analyses of particular dependent variables. All but one analysis included between 42 and 44 subjects. Several subjects failed to complete the rankings of memory self-descriptiveness correctly, resulting in 34 subjects being available for this analysis.

under the descriptive and conceptual categories introduced in the section describing methods (pp. 51). Tables 1 through 8 present the matrices of means for significant interactions, also arranged in terms of these descriptive and conceptual categories. These tables include the levels of significance for lower order interactions embedded in high-order interactions, as well as for the pairwise tests of means within interactions. Analysis of variance tables from which the significant effects are drawn are presented in Tables 13 through 32, Appendix B. The Bonferonni test was used in all pairwise comparisons of means.

Presentness of Memories

A number of main effects and interactions of domain importance, event novelty, event valence, test format, and gender were obtained as they affected image vividness, confidence of recall, and frequency of rehearsal--dependent variables that deal with the clarity and the extensiveness over time of a memory's presentness in conscious experience. Main effects are reported within the text; Tables 1a, 1b, and 1c present the means and tests of significance for the lower and higher order interactions as they occur for these three dependent variables. The findings for each dependent variable are described below in turn, followed by an integrative summary.

Image Vividness

For image vividness there were interactions of Novelty x Importance, Importance x Valence x Gender, Novelty x Valence, and

Table 1a

Interactions for Presentness Variables: Image Vividness

Novelty x Importance			Novelty x Valence		
	C	R		P	N
H	4.92	5.04	C	5.38	4.67 *
L	5.09	4.48	R	4.68	4.80
				*	

Novelty x Valence x Test Format			Importance x Valence x Gender		
	G			M	
	P	N		P	N
C	5.66	4.52***	C	5.09	4.81
R	4.38	4.79	R	4.97	4.81

	p < .0006			n.s.	

	P	N		P	N
H	4.80	4.96	H	5.22	5.03
L	5.47	4.27	L	4.49	4.83
	p < .009			n.s.	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rank-Rate Index.

Novelty x Valence x Test Format. For the interaction of Novelty x Importance, pairwise tests of the means did not result in any significant contrasts. The direction of the means suggests that the interaction represents a trend in which memories of rare and commonplace events in high importance domains differed little in vividness—with a slight tendency for rare, important events to be more vivid than commonplace important events—whereas memories of rare events in low importance domains were experienced as considerably less vivid than memories of commonplace events in low importance domains. The means essentially suggest that, although memories of commonplace events in high and low importance domains and memories of rare events in high importance domains differed little from one another in the vividness of their imagery, memories of low importance, rare events were experienced by subjects as somewhat less vivid.

Interaction comparisons conducted on the significant three-way interaction of Importance x Valence x Gender suggest that males experienced memories of low importance, positive events as significantly more vivid than low importance negative events, but found memories of positive and negative events in high importance domains to be essentially equivalent in vividness. Females did not report significant differences in the vividness of positive and negative event memories for either high or low importance domains.

The significant two-way interaction of novelty and valence on image vividness was qualified by the effects of test format. Examination of the three-way interaction found the Novelty x Valence

interaction significant for subjects tested in groups, but not for subjects tested individually. Tests of the simple main effects suggest that subjects tested in a group found commonplace positive events to be recalled significantly more vividly than commonplace negative events, whereas rare positive and negative events did not differ significantly in vividness. In addition, group-tested subjects described memories of commonplace positive events as significantly more vivid than rare positive events, whereas commonplace and rare negative events were not experienced as significantly different in vividness. Again, no such differences between means obtained for subjects tested individually.

Confidence of Recall

For confidence of recall--the subject's estimate of how accurately a memory represents an event as it happened--there were interactions of Importance x Gender and Importance x Gender x Valence, as well as interactions of Novelty x Valence and Novelty x Valence x Test Format.

The significant two-way interaction between domain importance and gender was qualified by the effects of valence. Interaction comparisons conducted on the interaction between importance and gender within valence conditions suggest that, for positive events, males reported being significantly more confident of the accuracy of their memories of events in low importance domains than did females, but that males and females did not differ significantly in their confidence about memories of positive events in high importance

Table 1b

Interactions for Presentness Variables: Confidence of Recall

Novelty x Valence			Importance x Gender		
	C	R		M	F
P	5.84	5.54	H	5.65	5.61
N	5.53	5.70	L	5.87	5.34*

Novelty x Valence x Test Format			Importance x Valence x Gender								
	G			P			N				
	C	R		C	R		M	F			
P	6.03	5.47*	P	5.64	5.60	H	5.44	5.79	H	5.86	5.43
N	5.47	5.84	N	5.58	5.56	L	6.16	5.21***	L	5.58	5.47
	*						***	***			
	p < .007			n.s.			p < .00006			n.s.	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rating Index only.

domains. In addition, the means suggest that males were significantly more confident about their memories of positive low importance events than about memories of positive high importance events, whereas females were significantly more confident about their memories of positive high importance events than about memories of positive low importance events. No such male-female differences occurred in estimates of confidence about memories of negative events in high and low importance domains.

Examination of the simple main effects in the significant interaction of Novelty x Valence indicates a nonsignificant trend of differences, in which subjects reported being more confident of memories of commonplace, positive events than of memories of commonplace, negative events, with a smaller, reversed trend in the case of memories of rare events, in which negative events were recalled slightly more confidently than positive events.

This trend emerged more strongly with the addition of the factor of test format. Subjects tested in a group reported being significantly more confident about memories of commonplace positive events than about memories of commonplace negative events, with a nonsignificant trend in the opposite direction for rare events. In addition, group-tested subjects reported feeling more confident about their memories of commonplace positive events than about their memories of rare positive events; this difference in confidence did not hold in the case of memories of commonplace and rare negative events. No such interaction occurred for subjects tested

individually, whose means suggest that they were roughly equally confident of memories of positive and negative events, both rare and commonplace.

Frequency of Rehearsal

Frequency of rehearsal was determined by asking subjects to estimate the frequency with which they had thought about or told someone about a memory since the remembered event occurred. There was a main effect for gender, with the mean for females = 4.27, and the mean for males = 3.93, $F(1, 39) = 5.81$, $p < .02$. The direction of the means suggests that females think about or disclose past events more frequently than do males.

In addition to this main effect, there were several significant interactions: Importance x Valence, Novelty x Importance, and Novelty x Importance x Gender. Tests of the means in the Importance x Valence interaction suggest that, although subjects reported that they think about or disclose memories of low importance positive events significantly more frequently than memories of high importance positive events, they did not report such differences in frequency of recall and disclosure for high versus low importance negative events.

The nonsignificant differences between the means in the significant two-way interaction of Novelty x Importance suggest a trend in which subjects reported that rare events in high importance domains tend to be recalled or disclosed somewhat more often than commonplace events in high importance domains, with only a slight

Table 1c

Interactions for Presentness Variables: Frequency of Rehearsal

Novelty x Importance			Importance x Valence		
	C	R		P	N
H	3.70	4.30	H	3.69	4.19
L	4.31	4.10	L	4.38	4.00
				*	

Novelty x Importance x Gender

M			F		
	C	R		C	R
H	3.49	3.90	H	3.92	4.70*
L	3.98	4.36	L	4.63	3.83*
				*	*
	n.s.			p < .003	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rank-Rate Index.

tendency toward the reverse pattern in the case of low importance domains.

This trend becomes significant with the addition of the effects of gender. Tests of the interaction comparisons and simple main effects of the three-way interaction of Novelty x Importance x Gender suggest that females reported they think about or disclose rare events in important domains significantly more frequently than commonplace events in important domains and think about or disclose commonplace events in low importance domains significantly more often than rare events in low importance domains. There was no significant interaction between importance and novelty for males.

Summary of Findings for Presentness of Memories

As was expected, domain importance, valence, and event novelty interacted in complex ways to affect the presentness of autobiographical memories. In addition, both gender and test format influenced the effects of the three conceptual variables. Several general findings emerged. First, importance appears to mediate the impact of the relative frequency or novelty of events on the relative vividness of memories of the event. Whereas memories of commonplace, everyday events were found to be relatively vivid irrespective of the event's importance, memories of rare, unusual, infrequent events were found to be either relatively vivid or relatively nonvivid, depending on whether the events had occurred in domains of high importance or low importance. Thus, a rare, unusual, low frequency event may either

sink into relative memorial obscurity or may take on the memorial clarity of everyday, high frequency events, depending on the relative personal importance of the behavior domain in which the event occurs.

Second, the social context in which persons recall autobiographical memories appears to influence the effects of event valence and novelty on the relative clarity of their memories. The effects of social context on valence appeared only in the case of events that persons regard as constituting the everyday fabric of their lives. More specifically, when subjects were asked to recall life events silently while sitting in a small group of peers engaged in the same memorial task, they had clearer memories and were more confident of their recall of everyday positive events than of everyday negative events. Likewise, subjects in a group remembered commonplace events more clearly and confidently than rare events, but only when it came to positive events. When subjects recalled life events while not in a group of peers, they were not differentially affected by the emotional valence or the novelty of remembered events.

Third, males and females appear to differ in the clarity of certain kinds of memories, in the frequency with which they think about life events, and in the impact that personal importance has on determining which life events are represented in their most present autobiographical memories. Male subjects appeared to be particularly attuned to distinctions in the clarity and confidence of their recall of different types of low importance events, distinctions that were not experienced by female subjects. Males experienced memories of

positive low importance events as more vivid than negative low importance events--a difference not reported by females. Moreover, males were more confident of their recall of positive low importance events than were females.

Females' memories, on the other hand, were also affected by personal importance, but in ways different than were males' memories: Whereas personal importance affected males' clarity and confidence of recall, for females personal importance was found to mediate the impact of event novelty on how often they think about and talk about particular past events. Females were found to be occupied significantly more often with unusual important events than with commonplace important events, but more often with commonplace low importance events than with unusual low importance events. .pa

In addition to the above-described differences, the data suggest that females generally think about and talk about life events more often than do males.

Male and female subjects did appear to agree on one thing: Both reported that they are likely to think about or talk about low importance positive events more often than high importance positive events. Importance did not have the same differential impact when it came to negative events: High and low importance negative events appear to get roughly equal time in both self-reflection and self-disclosure.

Domain importance played a part in seven of the nine interactions obtained for the dependent variables related to the issue of memory

presentness. In general, domain importance appears to mediate the nature of the impact of novelty, valence, and gender on the clarity of persons' autobiographical memories, on persons' confidence about the memory's accuracy, and on the frequency with which persons recall autobiographical events.

Event Complexity

Subjects' reports of event complexity were affected by a number of interactions, including interactions of Valence x Gender, Novelty x Importance, Novelty x Importance x Gender, and Novelty x Importance x Valence x Test Format. Table 2 presents the means and tests of significance for these interactions, which are discussed in turn below.

Tests of the means in the interaction of Valence x Gender revealed no significant pairwise contrasts. The interaction appears to be due to a trend in which females judged remembered negative events as somewhat more complex than positive events, whereas males' complexity judgments did not differ much for positive and negative events.

Tests of the means in the interaction between novelty and importance for complexity suggest that whereas remembered rare events were seen as more complex than commonplace events when these events occurred in high importance domains, rare and commonplace events did not differ in remembered complexity when they occurred in domains of low importance.

Table 2

Interactions for Event Complexity

Novelty x Importance			Valence x Gender		
	C	R		P	N
H	3.88	4.51*	M	4.20	4.04
L	4.03	4.17	F	3.83	4.55

Novelty x Importance x Gender

	M			F	
	C	R		C	R
H	4.08	4.34	H	3.57	4.77***
L	3.83	4.22	L	4.31	4.11
	n.s.			**	*
				p < .003	

Novelty x Importance x Valence x Test Format

	P				N		
	C	G	R		C	G	R
H	3.50		4.50***	3.48	4.64		4.53
L	4.64		3.69**	3.69	3.56		4.31
	p < .0001			n.s.	n.s.		

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rank-Rate Index.

However, this interaction is qualified on the one hand by gender, and on the other by valence and test format. Regarding the qualifying effects of gender, females judged rare events in high importance domains to be significantly more complex than commonplace events in high importance domains, with no significant difference between commonplace and rare events in low importance domains. In addition, females saw commonplace events in low importance domains as significantly more complex than commonplace events in high importance domains, whereas they saw rare events in important domains as significantly more complex than rare events in low importance domains. No such interaction of importance and novelty obtained for males.

Regarding the four-way interaction of Novelty x Importance x Valence x Test Format, interaction comparisons traced the effect to the condition in which group-tested subjects judged the complexity of positive events. In this condition, a significant reversal in the direction of the means obtained: Group-tested subjects judged positive, rare events to be significantly more complex than positive commonplace events when these occurred in high importance domains; for events drawn from low importance domains, commonplace positive events were seen as more complex than rare positive events. Significant interactions did not emerge for group-tested subjects judging negative events, or for individually tested subjects judging either positive or negative events.

Summary of Findings for Event Complexity

The patterns of the three significant interactions suggest that

something about recalling events in one's life while sitting in a group of other persons remembering their life events, and something about being female, enhance attunement to remembered event complexity. More specifically, females and persons who are asked to recall life events while in a group of others may be more attuned to or affected by an event's novelty, valence, and importance when making judgments about the complexity of remembered past events than are males or persons asked to evaluate recollected life events while isolated from their peers.

Domain importance figured into two of the three interactions obtained for judgments of a remembered event's complexity; in both cases, importance appeared to mediate the impact of event novelty on judgments of event complexity.

Affective Aspects of Autobiographical Memories

Three aspects of the affective experience of remembering personal events were explored in the present study: emotional vividness, or the clarity with which a person recalls emotions experienced during the event; pleasantness, or the degree to which the person finds it pleasurable or pleasant to recall the event; and desirability, the person's retrospective assessment of how desirable it was that the event occurred.

A number of main effects and interactions affected subjects' responses on these dimensions. Tables 3a, 3b, and 3c present the means and tests of significance for the interactions.

Emotional Vividness

A significant Novelty x Importance interaction emerged for emotional vividness. The tests of the means suggest that memories of relatively rare events were experienced as significantly more emotionally vivid than were memories of commonplace events, but only when these events were in domains of high importance: Memories of rare and commonplace events in personally unimportant domains differed little in emotional vividness. In addition, memories of events in important domains were experienced as more emotionally vivid than were memories of events in low importance domains, but only when these memories are of relatively rare events: High and low importance commonplace events differed little in emotional vividness.

A marginal ($p < .06$) three-way interaction between novelty, importance and valence suggests that when positive events were recalled, rare events in important domains were significantly more emotionally vivid than were commonplace events, but that in low importance domains, commonplace events were significantly more emotionally vivid than rare events. In addition, whereas high importance rare events were significantly more emotionally vivid than low importance rare events, low importance commonplace events were significantly more emotionally vivid than high importance commonplace events. No such interaction occurred in the case of negative events, where the pattern in the above-described significant two-way interaction pattern held. Because the modification of the Novelty x Importance interaction in the case of positive events was only

Table 3a

Interactions for Affective Attributes of Autobiographical Memory:
Emotional Vividness

Novelty x Importance		Novelty x Importance x Valence (marginally significant)							
		P		N					
	C	R		C	R		C	N	R
H	4.48	5.42**	H	4.32	5.24**	H	4.63	5.60**	
L	4.97	4.72	L	5.30	4.55*	L	4.63	4.89	
		*		**	*				**
				p < .001				n.s.	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rank-Rate Index.

marginally significant, it must be viewed as a tentative finding.

Pleasantness

There was a highly significant main effect for valence on subjects' descriptions of memory pleasantness, with the mean for positive events = 5.01 and the mean for negative events = 3.13, $F(1, 39) = 91.85$, $p < .0001$. The direction of the means indicates that positive events were seen as more pleasant to recall than negative events. This finding essentially represents an affirmation of the success of the experimental manipulation of valence.

There was also a significant main effect for novelty, with the mean for commonplace events = 4.30 and the mean for rare events = 3.83, $F(1, 39) = 7.15$, $p < .01$. The means suggest that commonplace events were seen as more pleasurable to recall than rare events.

A three-way interaction of Novelty x Valence x Test Format left the main effect for valence intact but qualified the main effect for novelty. That is, whereas the interaction was ordinal with respect to both the effects of valence and novelty, the significant novelty effect appeared to obtain only under certain conditions. Interaction comparisons indicate that for individually tested subjects, commonplace positive memories were reported to be significantly more pleasant than rare positive memories, but that memories of commonplace and rare negative events did not differ in level of pleasantness. No such interaction between novelty and valence occurred for group-tested subjects; furthermore, although examination of the means suggests that memories of commonplace events were reported to be more pleasant than

Table 3b

Interactions for Affective Attributes of Autobiographical Memory:
Pleasantness Interactions

Novelty x Valence x Test Format

	G			I	
	P	N		P	N
C	5.32	3.20	C	5.38	3.30***
<hr/>					
R	5.09	2.88	R	4.35	3.11***

	n.s.			p < .01	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rank-Rate Index.

memories of rare events regardless of valence, these differences were not significant. Thus, the novelty main effect described earlier appears to have been due largely to differences in the level of pleasantness experienced by individually tested subjects for memories of rare and commonplace positive events.

Desirability

There was a highly significant main effect for valence on subjects' descriptions of event desirability, with the mean for positive events = 4.36 and the mean for negative events = 2.55, $F(1, 41) = 125.13$, $p < .0001$. As with pleasantness, positive events were seen as significantly more desirable than negative events.

However, also like pleasantness, this main effect was qualified though not eliminated by the effect of test format. The significant Valence x Test Format interaction was ordinal with respect to valence, and the interaction effect appears to have been due to a reversal pattern in which positive events were evaluated as more pleasant by group-tested subjects than by individually tested subjects, whereas negative events were evaluated by group-tested subjects as less desirable than they were by individually tested subjects. Consequently, there was greater spread between the means for the desirability of positive versus negative events in the case of subjects tested in a group setting than for subjects tested individually.

Table 3c

Interactions for Affective Attributes of Autobiographical Memory:
Desirability Interactions

Valence x Test Format

	P	N	
G	4.68	2.35***	(p < .00000001)
I	4.13	2.68***	(p < .0001)

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rate Index only.

Summary of Findings for Affective Aspects of Autobiographical Memories

A number of interesting findings emerged for the variables related to the person's affective experience of autobiographical memories. First and foremost, domain importance appears to have a significant impact on the vividness with which emotions experienced at the time of a life event were recalled. The effect of importance seems to have been in mediating the effect of event novelty on emotional vividness. Emotions surrounding relatively unusual past life events were recalled more vividly than emotions surrounding everyday past events, but only in domains of personal importance: When remembered events derived from low importance domains, event novelty had little impact. If anything, emotions surrounding low importance, positive, commonplace events were remembered more clearly than those surrounding low importance, positive, rare events, though this latter, significant effect was embedded in a marginally significant interaction.

Another salient finding was that the emotions experienced around unusual, important events were significantly more vivid than those experienced about unusual but unimportant events. This finding sheds further light on the previously discussed finding that memories of low importance, rare events were less imaginatively vivid than memories of low importance commonplace and high importance events: Importance appears to be the determining factor in whether a past event will be regarded as rare and special--and thus relatively well-recalled--or rare and obscure, and relatively poorly recalled. In other words,

importance seems to determine whether a memory of a rare event becomes as much a part of the person's storehouse of personal recollections as do memories of everyday, frequent occurrences.

In addition, although the effects of importance came through clearest for rare events, there was some indication that importance may differentially affect memories of the emotions surrounding commonplace events, at least in the case of commonplace positive events. Interestingly, the effect for positive commonplace events was the reverse of that for rare events, with emotions surrounding low importance commonplace events being experienced as more vivid than emotions surrounding high importance commonplace events.

Together, the findings regarding emotional vividness suggest that domain importance mediates the effects of event novelty on the emotional vividness of memories.

Although the emotional valence of an event did not emerge as a factor in the emotional vividness of personal memories, event valence had clear effects on persons' experience of the relative pleasantness of various memories, as well as on their sense of the relative desirability of the events represented in autobiographical memories. Positive memories were experienced as more pleasant than negative memories, and positive events were viewed as more desirable than negative events.

The social context in which persons recall events appeared to have an impact on the affective qualities of autobiographical memories. Subjects tested individually found memories of commonplace,

positive events more pleasant than memories of rare, positive events, whereas subjects tested in a group setting were not significantly affected by novelty. However, subjects tested while in the presence of peers were more responsive to the effects of valence than were subjects tested alone, with differences suggesting that, although positive events are more desirable than negative events no matter where one remembers them, the difference in judged desirability is greater when one recalls these events when in a group of other persons similarly engaged in remembering personal events than when alone. The social context effects on sensitivity to event valence suggest that, although positive life events are remembered as being more desirable than negative life events no matter where they are recalled, the difference in judged desirability is greatest when persons recall life events in the presence of others.

Event Consequentiality

A number of main effects and interactions emerged on the two dependent measures that assessed the perceived consequentiality of remembered life events. These two measures were event significance--the subject's retrospective evaluation of the influence a remembered event had on his or her life course relative to other events--and event impact--the subject's recollection of the effect the event had on him or her at the time it occurred. Means and significance levels for main effects are again presented in the text; Table 4 presents the means and tests of significance for the interactions.

Significance

There were two main effects on significance, one for novelty and the other for gender. The means for the main effect of novelty suggest that rare events were retrospectively viewed as generally more significant than commonplace events, with the mean for rare events = 4.54 and for commonplace events = 3.64, $F(1, 41) = 16.79$, $p < .0001$. The main effect for gender suggests that females regard remembered life events as more significant than do males, with the mean for females = 4.29 and the mean for males = 3.96, $F(1, 41) = 7.54$, $p < .01$.

However, the effects of novelty and gender are qualified by one another as well as by domain importance, as was indicated by the significant three-way interaction of these three variables. The three-way interaction was ordinal with respect to the main effect of novelty, but not with respect to the main effect of gender. Pairwise contrasts of means found that for females rare events were viewed as significantly more significant in their lives than commonplace events when these events involved important domains, whereas rare and commonplace events in low importance domains did not differ significantly. On the other hand, males viewed rare events in low importance domains to be more highly significant than commonplace events; like the female subjects, they tended to view rare events in important domains to be more significant than commonplace events, but the difference between the means did not achieve statistical significance.

Table 4

Interactions for Consequentiality Variables

Importance x Valence

	P	N
H	3.95	4.16
L	4.29	3.96

Importance x Novelty x Gender

	M			F	
	C	R		C	R
H	3.54	4.24*	H	3.53	5.06***
L	3.49	4.56**	L	4.14	4.43
	n.s.			p < .01	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Significant interactions were obtained only for the Significance scale. Impact yielded two main effects, described in the text.

Note 3. Cell means for the above interaction are based on the Rate Index only.

There was also a two-way interaction between domain importance and valence. The interaction appears to have been due to a reversal trend, in which negative events were seen as more significant than positive events when the events were in high importance domains, whereas positive events were seen as more significant than negative events in the case of low importance domains. However, neither of the tests of simple main effects was significant.

Impact

The main effects for novelty and gender described above for event significance emerged for event impact as well and were unqualified by interactions. Rare or relatively unusual events were seen as having a greater impact at the time they occurred than were commonplace events, with the mean for rare events = 4.53 and the mean for commonplace events = 3.81, $F(1, 41) = 17.50$, $p < .0001$. Females saw life events as generally more impactful than did males, with the mean for females = 4.44 and the mean for males = 3.96, $F(1, 41) = 4.27$, $p < .05$.

Summary of Findings for Event Consequentiality

Although the main effect found for novelty was qualified by gender and domain importance in subjects' assessments of the significance of remembered autobiographical events, this novelty main effect appeared unqualified in subjects' responses to the more specific event impact. Together these findings suggest that, in general, relatively rare, infrequent, unique events are seen as having greater immediate and long-term consequences than are commonplace,

frequent, everyday events: Rare events were seen as having had a greater effect at the time they occurred--as well as a stronger influence on future life course--than are commonplace, frequent, everyday life events. Because the immediate impact of an event is by definition a more circumscribed, time-limited effect than is the significance of an event in the person's subsequent life course, the lack of interactions qualifying the main effect of novelty on impact may be the result of there simply being less of an opportunity for other variables to affect impact than to affect significance.

Likewise, although the main effect of gender on significance was found qualified by other variables, this main effect emerged without qualification for impact: Females were found to be significantly more affected by life events when the events first occur than were males.

On the other hand, persons' judgments about the long-term influence or significance of life events--in essence, their evaluations of the extensiveness of the sequelae of discrete life events--appear to be influenced by a combination of the person's gender, the event's degree of novelty, and the personal importance of the behavior domain that the event represents. The data indicate that females make a distinction between the greater significance of rare over commonplace events only in high importance domains: Males make the same distinction, but significantly so only as it pertains to events from low importance domains.

Men and women both show a trend toward viewing negative events as having greater ramifications than positive events, but only when these

events represent domains of personal importance; in low importance domains, positive events were actually viewed as influencing one's life course more than do negative events.

Whereas domain importance appears to have no identifiable effect on the immediate impact of events in a person's life, domain importance plays a central mediating role in determining the effects of an event's novelty and valence on the longer term ramifications of life events.

More broadly, it is interesting to note that domain importance did not emerge as a main effect for either impact or significance, but was involved in both of the interactions obtained for significance. This general finding adds further support to the notion that the role of domain importance in autobiographical memory is mediational, rather than direct: Domain importance creates the cognitive conditions that allow for differentiations in terms of other factors, such as novelty and valence.

Event Predictability and Frequency

Three aspects of a person's sense of the predictability and frequency of various types of autobiographical events were explored in the present study: expectancy, likelihood, and novelty. The expectancy scale asked subjects to recollect the degree to which an event was expected at the time it occurred. This dimension was designed to tap the degree to which a life event followed naturally from the context of previous events in the person's life, as the person viewed their life at the time.

Whereas the expectancy scale asked subjects to recall their past evaluations of events, the likelihood scale required subjects to make predictions about future events on the basis of their evaluations of the past frequency of similar events. Specifically, subjects were asked to rate the likelihood that an event similar to a particular remembered autobiographical event would happen to them again sometime in the future.

The novelty scale asked subjects to indicate how unusual or unique a remembered event was for them. This scale hewed closest to the intended manipulation of novelty as an independent variable. Tables 5a, 5b, and 5c present the interactions and tests of significance for effects on these three related dimensions.

Novelty

A highly significant main effect emerged for the independent variable of novelty on subjects' evaluations of novelty, with the mean for rare events = 5.37 and the mean for commonplace events = 3.83, $F(1, 41) = 64.79$, $p < .0001$. The direction of the means suggests that novelty was effectively manipulated: Rare events were seen as more unusual or unique than commonplace events.

There was a significant four-way interaction of Novelty x Domain Importance x Valence x Gender which was ordinal with respect to novelty: Examination of the means shows that, in all cases, rare events were seen as more novel than commonplace events. Thus, the impact of the novelty cueing procedure on subjects' subsequent

Table 5a

Interactions for Predictability and Frequency Variables: Novelty

Importance x Novelty x Valence x Gender												
	M						F					
	P			N			P			N		
	C		R	C		R	C		R	C		R
H	3.40		5.24	4.08		5.08***	3.58		5.26	3.63		5.63
L	4.08		5.16	3.72		5.52***	4.00		5.68	4.11		5.47
	n.s.			p < .05			n.s.			n.s.		

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rate Index only.

estimations of the novelty of remembered events was not altered by other independent variables.

The four-way interaction appears to have been due to a nonsignificant reversal trend in the direction of the means in one of the four lower order interactions. The interaction provides little additional valuable information and will not be discussed further.

The most interesting aspect of the means involved in this interaction had to do with a gender difference in the degree to which rare events were seen as more novel than commonplace events in high and low importance domains. In the case of males recalling positive events and females recalling positive or negative events, there was a larger difference between the means for memories of rare and commonplace events in high importance domains than for memories of events in low importance domains. However, the pattern is reversed for males recalling negative events: Males appeared to have viewed rare and commonplace negative events in low importance domains to be more different in relative novelty from each other than rare and commonplace negative events in high importance domains.

Expectancy

Two main effects emerged on expectancy--one for novelty and the other for valence. Commonplace events were seen as significantly more expected at the time they occurred than were rare events, with the mean for commonplace events = 3.51 and the mean for rare events = 2.97, $F(1, 41) = 5.07$, $p < .05$. Positive events were also significantly more expected than negative events, with the mean for

Table 5b

Interactions for Predictability and Frequency Variables: Expectancy

Valence x Gender		Novelty x Valence x Test Format								
			C			R				
	P	N	P	N		P	N			
M	3.32	3.21	G	3.22		3.33	G	3.53		2.53***
F	3.66	2.75*	I	4.02		3.31**	I	3.04		2.83

positive events = 3.47 and the mean for negative events = 3.01, $F(1, 41) = 7.43, p < .01$.

These main effects were qualified by a two-way interaction of Valence x Gender and a three-way interaction of Novelty x Valence x Test Format. Pairwise tests of the means of the Valence x Gender interaction indicate that females viewed positive events as significantly more expected than negative events, whereas males did not significantly differentiate between the expectedness of positive and negative events.

Regarding the significant three-way interaction of Novelty x Valence x Test Format, interaction comparisons of the Valence x Test Format interactions within novelty conditions only approached significance. However, pairwise tests of the means suggest that for group-tested subjects, positive rare events were experienced as significantly more expected than negative rare events, whereas no such difference occurred between positive and negative commonplace events. Individually tested subjects, on the other hand, reported experiencing positive commonplace events as significantly more expected than negative commonplace events, while reporting no such difference between positive and negative rare events.

Likelihood

As with expectancy, novelty and valence emerged as main effects on subjects' estimations of event likelihood. The effects were also in the same direction as those for expectancy: Commonplace events were seen as significantly more likely than rare events, with the mean

Table 5c

Interactions for Predictability and Frequency Variables: Likelihood

Importance x Test Format

	G	I
H	4.27	4.84
L	4.80	4.17

Novelty x Importance x Valence x Gender
(marginally significant)

	M				F			
	C		R		C		R	
	P	N	P	N	P	N	P	N
H	5.64	4.36**	4.12	3.88	5.53	5.05	4.84	3.53***
L	5.20	5.12	4.40	3.24	4.74	4.95	3.58	4.11
	p < .06		n.s.		n.s.		p < .005	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rate Index only.

for commonplace events = 5.08 and the mean for rare events = 3.96, $F(1, 41) = 41.10$, $p < .0001$; and positive events were judged to be significantly more likely than negative events, with the mean for positive events = 4.77 and the mean for negative events = 4.26, $F(1, 41) = 10.67$, $p < .001$.

There was a marginally significant ($p < .06$) four-way interaction of Novelty x Domain Importance x Valence x Gender. The interaction was ordinal with respect to novelty but not with respect to valence. Tests of the means did not result in clear, informative findings.

There was a significant Domain Importance x Test Format interaction. However, tests of simple main effects were not significant, suggesting that the interaction was due to a reversal trend. Subjects tested in the group format showed a tendency to predict that events similar to remembered events in low importance domains were more likely to occur than events similar to past events in high importance domains, whereas subjects tested individually predicted that events similar to remembered events in high importance domains were more likely to occur than those in low importance domains.

Summary of Findings for Event Predictability and Frequency

Three clear general findings emerged for novelty, expectancy, and likelihood as a group. First, the present method of cueing subjects to obtain their memories of commonplace and rare autobiographical events appears to be effective, given the highly significant main

effect for event novelty on subjects' evaluations of event novelty. No doubt a better test of the usefulness of this cueing method would involve a longer delay between a subject's production of memories of rare and commonplace events and his/her estimations of event novelty, so as to control more fully for the possibility that subjects will recall which memories they produced for each of the two novelty conditions. However, it should be remembered that, in the current study, subjects did not have any formal written cues with which to identify the experimental conditions to which particular memories belonged. Thus, it can be assumed with some confidence that the present procedure of directly cueing subjects to recall memories of commonplace and rare events results in production of remembered events that differ significantly in self-reported novelty.

Second, event novelty appears to have had a robust effect on subjects' assessments of an event's expectancy and likelihood: Commonplace events were seen as generally more expected than rare events, and as more likely to occur in the future than rare events. Whereas the interaction of novelty with valence and test format in the case of expectancy qualified the novelty main effect, the qualifying interaction was ordinal with respect to novelty with the exception of one cell comparison. Additionally, this qualifying interaction was marginally significant at the lower order level.

Third, whereas event valence emerged as a main effect on subjects' estimates of both expectancy and likelihood, the impact of valence was clearly less robust than that of event novelty, as

qualifying interactions were not ordinal for valence. Thus, the data suggest that persons' retrospective estimates of the degree to which a life event was expected, and their predictions of how likely it is that events similar to past events will occur in the future, are influenced more clearly by the relative uniqueness, rarity, or frequency of the event in their lives than by the emotional valence of the event.

The interactions that emerged involved either gender or test format. Regarding gender differences, males and females differed from one another in their judgments of event expectancy. Females were found to differentiate between the expectedness of positive and negative events, whereas men did not.

One other gender effect noted above is interesting in that it fits a pattern emerging across the various qualitative domains and subgroups of findings: Males were found again to pay special attention to memories of events in low importance domains, this time in judgments of the relative event novelty.

In regard to the impact of test format of expectancy, both persons tested in a group and persons tested individually saw positive events as more expected than negative events. However, for persons seen in a group, this distinction was made only in the case of rare events, whereas for persons seen individually, it was made only in the case of commonplace events. Likewise, all subjects were affected by domain importance in their estimates of event likelihood; however, the trend was for group-tested subjects to see events from low

importance domains as more likely than those from high importance domains, and vice versa for individually tested subjects.

Domain importance played a part in three of the four interactions obtained. The marginality of these interactions--at the higher order level, at the level of lower order comparisons, or at the level of pairwise contrasts--makes it impossible to outline definitively effects of importance on subjects' experience of the novelty, expectancy, and likelihood of remembered events. However, what is clear is that domain importance does have a significant effect on these qualities of remembered autobiographical events, and thus must be included as a factor in future investigations.

Memory of Intentions and Sense of Control in Autobiographical Events

The three scales constructed to determine the preemptive effects of domain importance, novelty, and valence on relative recall of information about intentions versus outcomes, as well as to determine subjects' evaluations of their intentions in past events, yielded only a few significant and near-significant findings. Likewise, there was only one significant finding for the scale assessing subjects' retrospective reports of the degree of control they experienced during remembered events.

Relative Focus on Intentions Versus Outcomes

There was one marginally significant finding ($p < .06$) for this scale: a three-way interaction of Novelty x Valence x Gender. Table 6 presents the means and tests of significance for this effect.

Table 6

Interactions for Memory of Intentions: Relative Focus on Intentions Versus Outcomes

Novelty x Valence x Gender
(marginally significant)

	M			F	
	C	R		C	R
P	4.75	4.48	P	4.56	4.50
N	3.96	4.90**	N	4.67	4.53
	* p < .01			n.s.	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rate Index only. The lower the numerical value, the greater the focus on intentions; the higher the number the greater the focus on outcomes.

Interaction comparisons and tests of simple main effects suggest that male subjects' memories of rare negative events involved a significantly greater degree of focus on outcomes versus intentions than did their memories of commonplace negative events. No such difference appeared for males in their recollections of positive commonplace versus positive rare events. In addition, the mean for commonplace negative events was significantly lower than that for commonplace positive events, suggesting that male subjects reported significantly more focus on intentions in the case of commonplace negative events than in the case of commonplace positive events. There were no significant differences found for females.

Match Between Intentions and Outcomes

A significant main effect for valence emerged for subjects' perceptions of the match between their intentions and the outcomes of their behavior in remembered events. Subjects believed there was a significantly greater match between intentions and outcomes in the case of positive events than in the case of negative events, with the mean for positive events = 4.89 and the mean for negative events = 3.17, $F(1, 39) = 87.08$, $p < .0001$.

Evaluations of Intentions

The finding that subjects experienced greater match between intentions and outcomes for positive than for negative events is clarified by the finding of a main effect for valence on subjects' ratings of the relative goodness and badness of their intentions.

Subjects reported that their intentions were significantly more positive in the case of positive events than in the case of negative events, with the mean for positive events = 5.59 and the mean for negative events = 4.55, $F(1, 39) = 32.44$, $p < .0001$.

Perceived Control over Events

A main effect for valence occurred for subjects' retrospective evaluations of the degree of control they had at the time remembered events occurred. Subjects believed they had significantly more control over positive than over negative events, with the mean for positive events = 4.47 and the mean for negative events = 3.28, $F(1, 40) = 48.80$, $p < .0001$. It is interesting to note that, even in the case of positive events, subjects' sense of the degree of control they had over past events was not terribly high, given that the mean fell just over the midline of the 7-point rating scale.

Summary of Findings for Memory of Intentions and Control

Exploration of the issue of whether novelty, valence, and domain importance systematically affect persons' relative recall of the outcomes of their behavior versus the intentions behind the behavior yielded one marginally significant but intriguing finding: Whereas females recalled relatively equal amounts of information about intentions and outcomes irrespective of the event's novelty, valence, or importance, males recalled more about outcomes than about intentions when it came to rare negative events, as compared to memories of commonplace, negative events. When it came to positive

events, novelty had no identifiable impact on males' relative recall of intentions versus outcomes. Males recalled significantly more about intentions than outcomes in memories of commonplace negative events than in memories of commonplace positive events.

Although the findings for males may suggest that some degree of preemption occurred in the case of remembering rare, negative life events, the significant difference between the means for commonplace negative and positive events suggests that the effect may have been due to males' significantly greater degree of attention to the intentions behind their everyday value-violating behavior, especially as compared to the attention given to the intentions behind their everyday positive behaviors and rare negative behaviors.

Males and females did not identifiably differ in respect to the other issues examined around the topic of evaluation of intentions and outcomes. The data suggest that persons view their intentions as being significantly more concordant with the outcome of their behavior when it comes to their positive behavior than when it comes to their negative behavior. Thus, it would appear that persons view their positive past behavior as resulting from their plans and good intentions and view their negative past behavior as resulting from the constraining effects of situational determinants on their good intentions.

This interpretation of the data is further supported by the finding that subjects remembered their positive past behavior as being more under their control than was their negative past behavior.

Nevertheless, the data suggest that--accurately or not--persons do acknowledge that their negative behavior is somewhat deliberate and under their control: Subjects reported that the intentions behind their negative behavior were not as good as the intentions behind their positive behavior.

Domain importance did not play a part in the differences obtained regarding the relative salience of information about intentions and outcomes in autobiographical memories; nor did importance emerge as a factor in the degree of match between intentions and outcomes, in subjects' evaluations of their intentions, or in their perceived degree of control over past events. Thus, it appears that domain importance may have little impact on these aspects of autobiographical memories, at least in the case where these qualities are assessed by persons themselves.

Memories and Self-Concept: Self-Descriptiveness and Age-Relatedness

Several factors affected subjects' evaluations of the degree to which remembered events captured or described them in the present, as well as their evaluations of the degree to which an event's occurrence had to do with their age at the time of the event. Tables 7a and 7b present the means and tests of significance for the interaction effects.

Self-Descriptiveness

There was a significant main effect for novelty on the degree to which subjects found their various memories self-descriptive.

Table 7a

Interactions for Memories and Self-Concept: Self-Descriptiveness

Importance x Valence

	P	N
H	4.04	5.31**
L	4.30	4.25
		*

Novelty x Test Format

	C	R
G	3.83	5.16*
I	4.38	4.54

Novelty x Gender

	C	R
M	4.39	4.59
F	3.67	5.23**

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rate Index only. The lower the numerical value, the greater the self-descriptiveness of the memory.

Memories of commonplace events were reported to be significantly more self-descriptive than were rare events, with the mean for commonplace events = 4.12 and the mean for rare events = 4.83, $F(1, 31) = 9.73$, $p < .001$. (Recall that subjects used a ranking scale to evaluate self-descriptiveness; thus, lower means signify higher scores.)

However, the effects of novelty were qualified by two two-way interactions: an interaction of Novelty x Test Format and an interaction of Novelty x Gender. Tests of simple main effects in the Novelty x Test Format interaction found that the means for commonplace and rare events were significantly different in the direction of the main effect for subjects tested in a group format, but not for subjects tested individually, for whom memories of commonplace and rare events appear to have differed little in self-descriptiveness. Likewise, tests of simple main effects for the Novelty x Gender interaction found that the mean for commonplace events was significantly higher than for rare events, but only for females. No such difference was found for males.

Thus, for males and females recalling life events while in a group setting, and for females in general, the relative frequency with which events occurred in a subject's life affected the degree to which memories of these events were considered descriptive of self, with memories of commonplace events judged as more self-descriptive than memories of rare events.

The most interesting finding was the two-way interaction of Domain Importance x Valence. Pairwise tests of the means found that

subjects ranked memories of positive events as significantly more self-descriptive than memories of negative events, but only when these memories were of events in domains of high importance. No such difference obtained between positive and negative memories in the case of low importance domains.

In addition, memories of negative events in high importance domains were found to be significantly less self-descriptive than memories of negative events in low importance domains.

Age-Relatedness

There was a main effect for novelty on age-relatedness, in which rare events were seen as more related to the subject's age at the time of the event than were commonplace events: The mean for rare events = 4.51 and the mean for commonplace events = 3.67, $F(1, 41) = 29.93, p < .0001$.

However, this main effect was qualified by the two-way interaction of Novelty x Test Format, which was in turn qualified by the three-way interaction of Novelty x Valence x Test Format. Tests of the interaction comparison and simple main effects in the three-way interaction indicate that when subjects in either the group or individual test format recalled negative events, and when group-tested subjects recalled positive events, rare events were seen as more age-related than were commonplace events. Individually tested subjects recalling positive events reported no such difference between commonplace and rare events. The difference between the judged age-relatedness of commonplace and rare events was greatest for group-

Table 7b

Interactions for Memories and Self-Concept: Age-Relatedness

Novelty x Test Format

	C	R
G	3.25	4.57***
I	3.95	4.47
	*	

Novelty x Valence x Test Format

	P			N	
	C	R		C	R
G	2.98	4.50***	G	3.53	4.64
I	4.16	4.08	I	3.75	4.87

	p < .001			n.s.	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means for the above interaction are based on the Rate Index only. The lower the numerical value, the greater the self-descriptiveness of the memory.

tested subjects recalling positive events. Group-tested subjects also judged commonplace positive events to be significantly less related to age than did individually tested subjects.

Summary of Findings for Self-Concept Variables

The most intriguing finding of those having to do with self-concept is that subjects found memories of their positive behavior significantly more self-descriptive than memories of their negative behavior, but only in the case of behavior representing high importance domains. On the broadest level, this finding provides further support for the notion that domain importance mediates the effect of other variables, such as valence, on persons' experience of their autobiographical memories. As pertains to the relationship between memory and self-concept, the finding demonstrates that it may be only in the cases where one exemplifies or violates domains of valued behavior--domains that matter to oneself--that one will care enough to differentiate between the self-descriptiveness of positive and negative events.

The findings pertaining to the impact of novelty on estimates of a remembered event's self-descriptiveness and age-relatedness together suggest that because memories of commonplace autobiographical events are generally viewed as more self-descriptive than are relatively rare autobiographical events, and because relatively rare events are seen as more age-related than are commonplace events, past behaviors that persons attribute to their age at the time when they behaved in the

ways recalled are probably less likely to be viewed as presently self-descriptive than are past behaviors which are seen as less a function of the person's age at the time of the remembered event. In other words, the findings suggest that the more a remembered autobiographical event is attributed to one's age at the time it occurred, the less likely it is that the event will be seen as representative of the person's present character.

However, this general formulation does not appear to apply to all persons with equal power or in all conditions, as the impact of novelty on the self-descriptiveness and judged age-relatedness was influenced by gender and test format, with females and subjects tested in a group context demonstrating more sensitivity to the impact of novelty than did males and subjects tested individually. Because there were males in the group-tested condition, and females in the individually tested condition, these findings cannot be regarded as conclusive.

Thus, the most clear-cut finding regarding the relation between autobiographical memory and self-concept is that domain importance determines the impact of event valence on the self-descriptiveness of personal memories. Only in the case of personally important domains does the individual distinguish between the self-descriptiveness of positive and negative autobiographical events (and the personal behavior embedded in these events): When it comes to personally unimportant domains, it appears that persons do not care enough about

their behavior to make distinctions between the self-descriptiveness of their past positive and negative behavior.

Temporal Variables: Memory Dating and Recall Latencies

Memory Dating

Four subjects failed to provide a usable date for one of their eight memories and had to be eliminated from the analysis, leaving a total N of 40. Dates of memories were transformed into natural logs for the analysis.

There was a main effect for novelty on dating of memories, in which subjects reported that remembered rare events were significantly older than remembered commonplace events. In natural logs, the mean for rare events = 5.18 and the mean for commonplace events = 3.31, $F(1, 37) = 31.68$, $p < .0001$. In terms of actual number of days, the mean age in days for rare events = 717 and the mean for commonplace events = 345.

There was also a two-way interaction of Valence x Gender. Table 8 presents the means and tests of significance for the interaction. Although none of the pairwise comparisons yielded significant contrasts, the means suggest that when asked to recall events in which they behaved in a positive fashion, females tend to recall somewhat older events than do males. Males and females do not differ much in the age of the events recalled when these events involve negative behavior.

Table 8

Interactions for Temporal Variables: Memory Dating

Valence x Gender

	P	N
M	3.90	4.33
F	4.68	4.15

Novelty x Importance x Valence
(marginally significant)

	P			N	
	C	R		C	R
H	2.92	5.33***	H	3.84	5.08**
L	3.41	5.25***	L	3.05	5.04***
	n.s.			n.s.	

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Cell means are comprised of natural logs of memory dates.

Recall Latencies

As was noted in the section describing methods, latencies were recorded only for the 26 subjects tested individually. Latencies were recorded in seconds elapsed from exposure of the memory cue card to the subject's verbal signal ("O.K.") that he or she had recalled a memory. These scores were then transformed to natural logs for analysis.

There was only one significant effect, a main effect for novelty. Subjects took significantly longer to recall a rare event than a commonplace event. In natural logs, the mean for rare events = 2.97 and the mean for commonplace events = 2.53, $F(1, 24) = 7.76$, $p < .01$. In terms of actual seconds, rare events took an average of 19.49 seconds to recall, whereas commonplace events were recalled in an average of 12.55 seconds.

Summary of Findings for Temporal Variables

The major combined finding for the two temporal variables examined was that memories of relatively rare events were older and took longer to recall than memories of relatively commonplace events. Memories of relatively unusual, infrequent, unique autobiographical events thus appear to be less accessible in memory than are memories of relatively frequent, everyday events and may require a more lengthy search process to recall. On the other hand, the greater latency for rare events may have been due, not to lesser accessibility, but to greater difficulty experienced in judging an event as unique and rare versus commonplace and relatively ordinary. The greater age of rare

memories may reflect the essential nature of relatively rare autobiographical events: Because there are by definition less of them, the person asked to recall them must probe more deeply into the past.

Discussion

The present study was mainly exploratory: A large number of variables were included to assess the range of influence that domain importance has on autobiographical memory. Few specific predictions were ventured other than that domain importance would have an impact on the nature of autobiographical memories. The data clearly confirm this general prediction: The personal importance of the behavior domain represented in a specific autobiographical memory clearly emerged as a significant factor in determining the qualities of the memory. Memories of autobiographical events from high importance domains differed in interesting ways from memories of events from low importance domains. In terms of percentages, domain importance was a factor in 54% of the significant interactions, influenced levels of 50% of the dependent variables, and emerged as an effect for 75% of the descriptive and conceptual categories under which the dependent variables were organized. Table 9 indicates the dependent variables and descriptive categories for which domain importance was a significant independent factor (an X indicates an effect for that measure; an O indicates no effect of domain importance).

As can be seen from this table, neither of the two temporal variables--recall latencies and memory dating--was significantly

Table 9

Presence and Absence of Significant Effects of Personal Importance on 20
Dependent Variables

Dependent Variables Organized by
Descriptive/Conceptual Categories

Presentness	
Image Vividness	X
Confidence of Recall	X
Frequency of Rehearsal	X
Event Complexity	
Affective Aspects	
Emotional Vividness	X
Pleasantness	O
Desirability	O
Event Consequentiality	
Significance	X
Impact	O
Event Predictability and Frequency	
Novelty	X
Expectancy	O
Likelihood	X
Memory of Intentions and Sense of Control in Events	
Relative Focus Intentions vs. Outcomes	O
Match Between Intentions and Outcomes	O
Evaluations of Intentions	O
Perceived Control Over Events	O
Memory and Self-Concept	
Self-Descriptiveness	X
Age-Relatedness	O
Temporal Variables	
Memory Dating	O
Recall Latencies	O

affected by domain importance; neither were the four variables having to do with memory of intentions and sense of control in events. Aside from these variables, all of the descriptive/conceptual categories involved at least one dependent variable affected by domain importance. Domain importance thus appears to have an impact on the experienced presentness, remembered complexity, affective intensity, and self-descriptiveness of autobiographical memories, as well as on the rememberer's sense of the consequentiality, predictability, and frequency of remembered past events.

In addition to the prediction that domain importance would be found to have significant effects on autobiographical memory, it was also predicted that the nature of this effect would be complex and interactive rather than simple and direct. This prediction was also borne out: Although playing a role in more than half of the obtained interactions, domain importance did not emerge as a main effect for any of the 20 dependent variables examined. As was noted repeatedly in the summary sections of the Results, the role of domain importance in autobiographical memory appears to be a mediational one: Domain importance mediates the effects of event novelty and event valence on autobiographical memory.

The large number of significant findings would make detailed discussion of all the findings unwieldy. The reader is referred back to the Results section for summaries of effects for the variables in each of the descriptive categories. The present section will discuss these findings on a broader level, with a focus on the role of domain

importance in autobiographical memory. Effects related to the central issue of autobiographical recall will be discussed first and in greatest detail. The discussion will then take up in turn the findings concerning affective qualities, event consequentiality, frequency and predictability, and, finally, the relation between autobiographical memory and self-concept.

Aside from the main theoretical and empirical issue of the impact of domain importance on dimensions of autobiographical memory, several other related issues will be discussed. Some of these issues were anticipated; others emerged from unexpected findings and point to areas for new inquiry. The issues to be taken up include:

1. The relationship between image vividness and emotional vividness.
2. The locus in the memory process of the impact of domain importance on autobiographical memory--i.e., in directing encoding processes, in affecting rehearsal frequency, or in influencing retrieval processes.
3. The possible impact of the "objective requiredness" of valued behavior on autobiographical recallability.
4. Gender differences in autobiographical memory.
5. The impact of social context on autobiographical memory.
6. Preemptive processes in autobiographical memory.
7. The relation between domain importance and recall latency, and the question of the ecological validity of recall latency as an indicator of memory availability.

8. The ability versus the willingness to recall autobiographical events.

9. The relation between domain importance and event consequentiality, and between consequentiality, memory rehearsal, and recall.

10. The relative impact of frequency of construct activation versus intensity of construct activation in development of high and low importance domains.

11. The relation between domain importance and self-concept, as well as between domain importance and self-relevant/self-referent processing.

The results of the present study indicated that two variables hitherto unexamined in the literature on autobiographical memory have an important and widespread effect on qualitative differences in autobiographical memory, namely, gender and the social context in which persons recall life events. The patterns obtained for these two variables will be discussed first in terms of their impact on recall. Broader patterns and implications regarding these gender and social context effects will then be addressed, along with a summary of the effects of domain importance, novelty, and valence on autobiographical memory. The discussion will end with a list of the major findings and theoretical implications that emerged from this study, followed by a prospectus for future research.

Domain Importance and Recallability

The studies described in the literature focused almost

exclusively on the identification of factors that influence the recallability of autobiographical memories. A number of findings from the present study bear upon this issue. The findings for the three variables having to do with memory presentness--image vividness, confidence of recall, and frequency of rehearsal--have direct bearing on the issue of recallability. Recall of the emotional features of an event is addressed in the findings for emotional vividness. Findings for remembered event complexity also relate to the issue of recall, as do the findings pertaining to relative recall of intentions versus outcomes. Finally, the recall latency and age of memory data shed light on temporal dimensions of recall.

General implications of the present results for conceptualizing and examining the effects of independent factors on recall of autobiographical events will be addressed first, followed by a summary and discussion of the specific patterns and implications of the data as pertain to event recallability.

General Implications of Present Results for Conceptions of Autobiographical Recall

The results of the present study add an important, two-part perspective on the findings described in the literature on autobiographical memory: First, the simple relations between independent variables and memory recallability described in previous studies may be less prevalent than complex interactions between independent variables and levels of recallability; and, second, certain independent variables found largely unrelated to recallability

in previous studies may only emerge when examined in conjunction with other independent variables.

In regard to the first point, the previously reported simple relations between memory recallability and independent factors such as distinctiveness, distinguishability (Linton, 1982, 1986), frequency (White, 1982), salience (Wagenaar, 1986), surprisingness (Fitzgerald, 1986), valence (Wagenaar, 1986), emotional intensity (Robinson, 1980; White, 1982), emotional involvement (Wagenaar, 1986), and personal importance (Fitzgerald, 1986; Rubin & Kozin, 1984) are qualified by the present findings. Event novelty--conceptually and operationally related to distinctiveness, frequency, salience, and surprisingness--did not emerge as a main effect for any of the dimensions that capture the quality of the person's subjective experience of recall: imagistic or emotional vividness, recall confidence, frequency of rehearsal, event complexity, or relative recall of intentions versus outcomes. Main effects for event novelty were found only for the two temporal variables, neither of which captures much of the subjective experience of recall. However, novelty was involved in interactions with other independent factors for each of the experiential recallability variables. Likewise, as noted above, the personal importance of behavior domains--conceptually and operationally related to the previously examined variables personal importance, emotional intensity, emotionality, and emotional involvement--did not emerge as a main effect. However, domain importance played a part in interactions for each of the experiential recallability variables.

Domain importance did not have a significant impact on either of the temporal variables.

In regard to the second point, event valence emerged as significantly related to recallability in only one of the three previous studies that assessed it as a variable (Wagenaar, 1986); yet, in the present study, valence played a part in significant interactions for image vividness, confidence of recall, frequency of rehearsal, and complexity, and in a marginally significant interaction for emotional vividness. Thus, examination of the interactive effects of valence, novelty and domain importance, along with gender and test format, allowed event valence to emerge as a significant factor in differences in event recallability.

Specific Findings on Autobiographical Recall

Domain Importance and Vividness

One of the more striking specific findings of the present study in regard to the issue of recallability was that domain importance mediated the effects of event distinguishability, frequency, or novelty on both the imagistic and emotional vividness of autobiographical memories. To review, the significant interaction between novelty and domain importance for image vividness was the result of a pattern in which the imagery in memories of relatively rare events in high importance domains matched the vividness of imagery in commonplace life events in both high and low importance domains, but the imagery in memories of rare events in unimportant

domains was less vivid. Likewise, the emotions experienced at the time of a past event were recalled significantly more vividly in the case of unusual (distinctive, salient, low frequency) events from important domains than unusual events from unimportant domains.

Together, these findings suggest that low frequency or unusualness is not a sufficient condition to enhance recall of a life event:

Relatively rare events become "distinctive" and memorable when they represent important behavior domains, and may become less distinctive and more forgettable when they represent relatively unimportant domains.

Although domain importance had a significant impact on both image and emotional vividness, the results suggest that domain importance may have greater impact on recall of the emotions involved in a past experience than on recall of details of the events themselves. This conclusion derives from two comparisons of findings for emotional and imagistic vividness. First, although rare important events were not found to be significantly more imagistically vivid than commonplace important events, rare important events were found to be significantly more emotionally vivid than commonplace important events. Second, although the difference in imagistic vividness for relatively rare events in high versus low importance domains resulted in a significant interaction, the difference between the means themselves was not significant; on the other hand, high and low importance rare events were significantly different in emotional vividness. Thus, whereas domain importance mediates the effects of novelty both for image

vividness and emotional vividness, importance appears to affect memory for experienced emotions more powerfully than memory for the details of what happened and of what the setting looked like at the time of the event.

It may be that this apparent pattern is due in part to a floor effect for memory imagery in the present study, given that all event memories had to be at least vivid enough for subjects to recall them when cued. The ramifications of this floor effect will be discussed at greater length later in this chapter. For now, suffice it to say that domain importance might be found to have as strong an effect on image vividness as on emotional vividness if the memories studied represented a greater range in image vividness.

Theoretical Implications: Relations Between Recall of Details and Recall of Emotions

The findings for image vividness and emotional vividness differ in regard to the degree to which domain importance has an effect. However, the similarity of the interaction patterns obtained for each suggests that there may be some relation between the vividness of the recall of event-related imagery and the vividness of recall of emotions associated with past events. What might the nature of this relation be?

It is likely that, during the act of remembering a life event, recall of event details and of emotions experienced during the event form a kind of interactive loop. Recall of a detail or set of details cues recall of experienced emotions; these recalled emotions then

prompt a search for further details and cue further recall of these details, which in turn cue other aspects of the remembered emotions. Relatively rare events from personally important domains (i.e., domains of behavior about which the person experiences strong emotion) will have engendered strong emotions at the time of the event. These emotions are then available during later recall to provide internal, mnemonic cues for aspects of the event represented in memory imagery. In contrast, relatively rare events from personally unimportant domains will likely have engendered relatively little emotional response at the time of the event; at time of recall, there will likely be fewer and less intense remembered emotions to contribute to the interactive loop between recall of emotion and recall of event detail, leading ultimately to a less imagistically rich or vivid personal recollection.

Although these explanatory musings remain to be tested directly, the patterns of means in the Novelty x Importance interactions for emotional vividness and imagistic vividness support this framework. In the emotional vividness interaction, it is the cell mean for high importance rare events that stands out as higher than the other three cells, which do not differ significantly from one another. In the imagistic vividness interaction, it is the cell mean for low importance rare events that stands out as lower than the other three cells, which are roughly equal. Thus, the means suggest that it is the enhanced presence of recalled emotion in the case of high importance rare events that allows the imagery in memories of high importance rare events to be on par with the imagery and detail of

commonplace events; correlatively, it is the absence of enhanced recall of emotion in the case of low importance rare events that leads to relatively poorer imagery vividness in the case of memories of low importance rare events. By this argument, the enhancement of the recall of emotions experienced in response to personal events from important domains provides richer internal mnemonic cues for the recall of event details and thus "rescues" the rare event from memorial obscurity.

Alternative Explanations: Enhanced Rehearsal
or Enhanced Encoding

Another argument centers on the possible effects of differences in frequency of rehearsal: Rare events from important domains might be thought about or disclosed more often than rare events from unimportant domains, and because they are more frequently rehearsed, they are better recalled. Interestingly, this argument is confirmed in the data--but only in the case of females. The data suggest that women think and talk about rare events from important domains more frequently than rare events from unimportant domains, that they think and talk about rare important events more frequently than commonplace important events, and that they think and talk about commonplace events from low importance domains more than rare events from these domains. With the exception of this last finding, the results for females correspond to the patterns found for imagistic and emotional vividness. Thus, for females, differences in the amount of rehearsal

given to memories of rare and commonplace events from high and low importance domains may largely determine differences in the emotional and imagistic vividness of memories of these respective types of events.

However, given that similar results did not emerge for males, it is likely that differential frequency of rehearsal is not the sole determinant of the vividness effects obtained for domain importance.

Yet another argument, equally cogent, is that proffered earlier, namely, that domain importance acts to enhance attention at the time of the event; therefore, rare, important events receive more thorough examination and encoding than do rare, unimportant events. This position is captured well by White's (1982) previously described notion that for events to be recalled they must be discriminable and must sufficiently move the experiencer to attend to and store them. Related work in cognition by Craik and Blankstein (1975) and Wyer (1980) support this explanation of the effects of domain importance on recall. However, data directly bearing on this hypothesis were not collected in the present study.

Any of the three hypotheses offered above to explain the interaction of domain importance with novelty--one based on the notion of a feedback loop between emotion and image leading to enhanced recall as a function of greater availability of emotional-mnemonic cues, another based on the notion of enhanced rehearsal, and another based on enhanced attention and encoding at the time of the event--may point to equally fruitful frameworks for future research on

determinants of autobiographical memory vividness. Furthermore, it is entirely likely that domain importance interacts with event novelty at each step of the memory process: attention and encoding, rehearsal, and retrieval.

Valued Behavior as Objectively Required:
The "Kohler Effect"

One pattern found for three of the dependent variables related to recallability was that, under certain conditions, low importance events were recalled more often or more fully than high importance events. To review:

1. Positive low importance events were found to be recalled significantly more frequently than positive high importance events, whereas no such difference obtained in the case of high and low negative events.

2. The marginally significant interaction of Novelty x Domain Importance x Valence for emotional vividness included a significant pairwise difference in which positive, low importance commonplace events were experienced as more emotionally vivid than positive, high importance commonplace events, with positive, high importance rare events exceeding positive, low importance rare events in vividness, and no such differences in the case of negative events.

3. Females remembered low importance, commonplace events as being significantly more complex than high importance, commonplace events, while finding high importance rare events to be more complex

than low importance rare events. Males made no significant differentiations of this sort.

4. Persons tested in a group of peers remembered low importance, commonplace positive events as being significantly more complex than high importance, commonplace positive events, while finding high importance, rare positive events more complex than low importance, rare positive events.

These data seem paradoxical at first glance: It might be expected that the heightened emotional intensity of events from high importance domains would lead memories of these events to exceed those from low importance domains in terms of presentness and remembered complexity.

The seminal work of Kohler (1938) sheds light on this paradox. Kohler noted that a central function of the process of valuation is to make the valued act or object seem "objectively required." Thus, if one values responsibility, one views responsible acts as status quo, expected, unremarkable--an objective requirement of being a person, and thus, not particularly salient in one's storehouse of autobiographical memories. On the other hand, exemplifications of a low importance domain may be relatively more emotionally salient because one does not regard such behavior as objectively required. Consequently, one may be more likely to tell others about or think about an occasion in that one enacted a low importance behavior than about occasions in which one enacted a commonplace, highly valued behavior which one regards as objectively required, and thus as not

particularly noteworthy. In addition, one might view commonplace events involving low importance behavior as more complex than commonplace events involving high importance behavior, because behavior in highly valued domains is more salient and, because more salient, likely to be more familiar, well practiced, and more readily comprehended than low importance behavior.

Needless to say, the concept of the "Kohler effect" is offered here as an intriguing hypothesis to explain some curious data and is stated more as a suggestion than as a conclusion. The concept requires further research.

Gender and Recallability

Another unexpected and intriguing set of data emerged from the unanticipated effects of gender on variables related to recallability. Gender had an impact on image vividness, confidence of recall, and, as was described above, frequency of rehearsal. Regarding image vividness, males appeared to discriminate significantly between positive and negative events in relatively unimportant domains, finding positive events more vivid. Males did not make such discriminations in the case of high importance events, and females did not make such valence discriminations in the case of either high or low importance events. The enhanced salience of low importance events for males is demonstrated also in the finding that males appeared to be significantly more confident of the accuracy of their memory of low importance positive events than were females. As will be discussed more fully in a later section, data involving a number of different

dependent variables suggest that males pay special attention to differences in memories of events from low importance domains--a seemingly paradoxical finding, given the notion and findings suggesting that high importance will enhance discriminations between memories, and low importance will result in decreased interest in, attention to, and differentiation of personal experience.

Males and females appear to differ in the types of memories that they believe they recall most accurately. Males appear to have more faith in their memory of low importance positive events than of high importance positive events, whereas females are more confident of their recall of high importance positive events than of low importance positive events. Males and females appear to be roughly equally confident of their memories of negative events, regardless of importance.

Regarding frequency of rehearsal, in addition to females' specific pattern of differential rehearsal of high and low importance rare and commonplace events, females appear to rehearse autobiographical memories spontaneously more frequently than do men.

Finally, females appear to make significant differentiations in regard to perceived complexity of remembered events, whereas males generally do not.

What do these findings say in general about gender differences in recall of autobiographical events? Most strikingly, females generally appear to think about and talk about the events in their past more often than do males. Females are more attuned to differences in the

complexities of remembered life events. They also experience differences in the types of memories that they think and talk about more often than others. Whether or not the frequency of rehearsal data are strictly accurate, these data indicate that the issue of the frequency with which different types of memories occupy reflection or conversation is one that women can readily respond to, whereas men may not be as concerned with this issue or as aware of their respective patterns of advertent and inadvertent memory rehearsal.

The data also suggest that males may be best able to recall relatively unimportant, emotionally neutral, positive events, whereas females may be more confident of their memories of high importance positive events. This suggests that for females, emotional intensity may enhance memory of personal events, whereas for males, a lack of emotional intensity in an event may enhance memory of that event. Examination of the means suggests that personal importance or emotional intensity do not preempt or interfere with males' autobiographical memory relative to that for females--males' reported recall of positive and negative events in personally important domains was roughly on par with that reported by females. In addition, the above-described vividness findings for important and unimportant rare events held for both males and females. Rather, males report even clearer and more accurate memories when events are relatively unimportant and emotionally neutral.

The gender findings also suggest that females may be more attuned to the experienced complexities of personal events.

Speculation on the source of these gender differences will be saved until later in the discussion; however, the pattern of the data suggests that socialization differences in the tendency to think and talk about past events as a major aspect of relating to others, and differences in comfort with experienced emotion, may have much to do with these differences in recall of life events.

Social Context and Recallability

The reasoning to be presented about the test format or social context effects obtained is decidedly post hoc. Social context was not an intentionally manipulated conceptual variable in this investigation; it emerged as a consequence of economizing the collection of individual subject data. Notwithstanding, the serendipitous quality of the social context effects is intriguing and further indicates the need to examine a wider set of potential factors in autobiographical memory than has been represented in the literature thus far.

On the most general level, the finding of test format effects on image vividness, confidence, and remembered complexity indicates that persons experience larger qualitative differences in their recall of various personal events when remembering these events in the context of peers than when isolated from peers. More specifically, the data suggest that remembering events while in the presence of peers leads to enhanced vividness and confidence of recall of positive, commonplace events as compared to negative everyday events or positive and negative rare events. In addition, the data suggest that

recalling events while with peers leads to the complexity differentiations for commonplace positive events discussed earlier in the section on the "Kohler Effect"--specifically, that among other things, high importance commonplace events are remembered as being significantly less complex than low importance commonplace and high importance rare events. These enhancements of differences in vividness, confidence of recall, and complexity do not appear for persons remembering life events while isolated from peers.

Although researchers in the area of autobiographical memory have not yet publicly addressed the effects of the presence or absence of others on recall of life events, there is a large literature dating back to the turn of the century which addresses the nature of the impact of the presence of others upon performance of motoric and cognitive tasks (e.g., Abel, 1938; Allport, 1920, 1924; Dashiell, 1935; Triplett, 1898; also see review by Bond, 1980). A number of these studies looked at the effects of the presence of others on tasks involving memory processes (Berkey & Hoppe, 1972; Cottrell, Rittle, & Wack, 1967; Criddle, 1971; Geen, 1976; Houston, 1970; Pessin, 1933). As a group, these studies investigated the impact on performance of a passive, observing audience, as well as the impact of others' simultaneous performance of the same task. Many of the early studies found that performance improved in the presence of others, leading Floyd Allport (1924) to term these audience and coaction effects "social facilitation."

Zajonc (1965, 1966) reworked the notion of social facilitation to encompass both the enhancing and inhibiting effects of the mere presence of others upon performance. He argued that the presence of others increases the level of "generalized drive" or motivation, and so facilitates emission of overlearned, well-rehearsed, "dominant" responses over relatively new, unfamiliar, or "subordinate" responses (Zajonc, 1965).

Bond (1980) argued that, rather than increasing generalized drive and facilitating dominant responses, the presence of others provides the context within which the person anticipates performance evaluation. The person thus engages in the response most likely to engender positive evaluation or reinforcement. Incorrect responses lead the person to anticipate negative evaluation, and so result in embarrassment, which in turn interferes with further successful performance. The person engages in constant self-evaluation as a means of inferring and anticipating the nature of the silent evaluations of others present.

In arguing for the central role of self-presentation in social context effects, Bond also drew upon Goffman's (1959, 1967) notion of the "face" or "public self-image." Goffman suggested that, upon entering a social situation, persons behave in particular ways to encourage perception of them by others in a positive light. Most often, this involves a self-presentation that abides by social norms. Other persons then respond to this self-presentation in ways that confirm the "face," and so, lead persons to behave in ways consistent

with others' perceptions of them. Self-presentation is thought to occur largely unconsciously, only becoming self-conscious when the individual experiences discrepancies between his or her self-presentation and other, usually negative information about self.

How might this literature explain the present social context effects for autobiographical memory? Specifically, how might these theories explain the enhancement of vividness and confidence of recall of positive commonplace events while in the presence of peers, as well as the enhancement of complexity differentiations?

In Zajonc's terms, in the task of recalling life events, recall of positive, commonplace events may represent the dominant response, with memories of other types of events representing subordinate responses. This argument has some a priori validity: Positive, everyday events are likely to constitute the largest, most familiar proportion of the person's daily behavioral routine and repertoire; therefore, persons may have more ready access to memories of everyday positive events than to everyday negative events or rare events. To some extent, other data from the present study bear this notion out, at least in regard to commonplace events: As a group, commonplace events were recalled more quickly, were more recent, and were generally more expected and considered more likely (and are thus probably in fact more frequent) than rare events.

On the other hand, main effects supportive of greater accessibility were not obtained for valence, nor were positive, commonplace events generally found more accessible or frequent than

events in the other three conditions in terms of these other indices. However, the strong main effect for valence on memory pleasantness and event desirability may mean that persons may be more willing to recall positive events than negative events; greater willingness to recall positive events, in combination with the generally greater accessibility and familiarity of commonplace events, may make recall of positive, commonplace events the dominant response in the autobiographical recall task. (The notion of the relation between valence and willingness to recall events will be more thoroughly addressed in an upcoming section.) It is less immediately clear how Zajonc's social facilitation model might explain the enhanced differences in remembered event complexity found in the group-tested case, especially the particular direction of these differentiations.

Bond's (1980) notion of the impact of the person's anticipation of evaluation and the importance of self-presentation concerns when performing in the presence of others may better explain the enhancement of recall of positive commonplace events as well as the enhanced complexity differentiations. Anticipating evaluation by present others, persons recalling life events may have clearer memories of behaviors and events that put them in the best light: memories that document how they behave in positive ways on an everyday basis. In addition, given that the notion of complexity is usually associated with difficulty and challenge, persons might tend to evaluate their everyday behaviors in domains that matter to them as being less complex--and therefore, less difficult or challenging--than

behaviors in domains of lesser personal importance, or than relatively rare examples of behavior, which, by virtue of their uniqueness, can be "excused" if somewhat more complex and difficult.

In addition, Goffman's (1959, 1967) notions of self-presentation, incorporated to some degree in Bond's (1980) framework, also help explain the effects obtained in the present study. If the "face" or "public self-image" that the person presents is geared to be normative in character, and if persons engage in a "covert" self-presentation when recalling life events in the presence of others, it makes sense that persons recalling life events in the presence of others would unconsciously strive for clearest recall of their everyday exemplifications of behavior domains. In addition, if presentation of self-image becomes a conscious process or issue when the person is faced with discrepancies about the self (i.e., information about negative behavior), then it makes sense that persons asked to recall their domain exemplifications and violations would seek to reduce these discrepancies by emphasizing the difference in the experienced presentness of the respective memories of positive and negative behavior.

Although Zajonc's (1965) and Bond's (1980) conceptions of the impact of the presence of others upon performance both shed light on the findings obtained in the present study, both essentially overlook the differences in how the person conceives of those present others. Surely, as suggested by Zajonc and Bond, others may often be cast in the role of potential reinforcement distributors or evaluators.

However, others may also be viewed as potential competitors for reinforcements. In this latter role, the presence of others is likely to prompt the person to compare self to others, and to compete covertly with others to present self in the best light so as to obtain more of the reinforcements anticipated from others.

More importantly, persons performing in the presence of others may engage in social comparison not primarily in anticipation of competing for rewards from others, but as a means of accumulating or modifying data about the self for purposes of self-definition and self-evaluation. The extensive literature on social comparison indicates that persons regularly and habitually judge themselves in reference to the perceived qualities of those around them (see Singer, 1980, for review).

Along with the importance of the process of social comparison as a means for persons to define themselves further--an activity important in its own right--the process of self-definition through social comparison is also a crucial step in preparing for self-presentation. In this manner, the insights of Goffman (1959, 1967) and Bond (1980) may be combined with the notion of the importance of social comparison in explaining the present social context findings. It may be that when persons sit in a group of peers and recall life events they go through a process of preparing for the social comparison and self-presentation that they anticipate occurring, simply by being in the presence of others. That is, because deliberate gatherings of persons in a group context almost inevitably

involve self-presentation and self-disclosure at some point, persons may covertly prepare for this self-presentation by adopting a "positive set." If then specifically asked to recall life events while in the group, persons may recall more clearly and confidently commonplace, everyday, positive events, events that represent them in the best light, even when they have not been instructed that they will share accounts of these remembered events with peers. By enhancing their access to commonplace positive events, persons may increase the likelihood that they will fare well in their comparisons of self to others. Likewise, by viewing commonplace autobiographical events in high importance domains as less complex than less positive and frequent behavioral events, the person may enhance his or her sense of mastery or control over important areas of his or her life.

To continue along this line of explanation, the absence of a significant effect for domain importance in the differences found for group-tested and individually tested subjects in image vividness and confidence of recall suggests that in this initial stage of covert self-presentation persons may only differentially access memories on relatively impersonal levels. To engage in differential accessing of memories on the basis of domains of high and low importance would be to bring more personal differentiations into focus, putting oneself at greater risk of negative self-judgments as a result of social comparison.

Thus, depending on whether the person construes others as esteem distributors or esteem competitors, the effects of the presence of

others may be largely due to social facilitation or to social comparison. In fact, it is possible that which of these two processes has greater impact upon a given person is determined in part by individual differences in the ways in which persons view present others (e.g., as "authority figures" or potential sources of reinforcement, or as peers with whom one must compete or compare oneself), and by individual differences in relative attunement to the evaluations bestowed upon self by others versus the evaluations bestowed upon self by self.

Although the social context effects are intriguing and provocative, these findings must be seen as tentative due to two possible confounds. First, latencies were not recorded for group-tested subjects as they were for individually tested subjects; thus, the effects might have been due to the impact of being timed in one's recall of autobiographical memories. Second, the difference between findings for group-tested and individually tested subjects cannot be characterized as differences between recalling autobiographical events while with others versus while alone, because subjects tested individually recalled events while in the presence of the experimenter. In addition, by being the only other person in the room, the experimenter may have been more salient for individually tested subjects than for group-tested subjects.

However, it is not immediately apparent how either or both of these two possible confounds might have accounted for the obtained results. Thus, although the present results cannot be viewed as

definitive, they may offer an initial demonstration of the impact of social context on recall of life events.

Relative Recall of Intentions and Outcomes

Data were not obtained in support of the notion of preemptive processes in autobiographical memory. Persons appear to recall relatively equally well the intentions behind their behavior and the outcomes of this behavior, regardless of the novelty, valence, or importance of the behavior. The one marginally significant interaction obtained suggested that males may have a tendency to reflect more on their intentions in recalling their everyday negative behavior than in recalling commonplace positive behavior or rare negative behavior. However, the data did not clearly suggest that certain conditions lead to an inability or unwillingness to recall intentions as opposed to outcomes, for either males or females.

There are a number of possible methodological and theoretical reasons for the lack of findings supporting the notion of preemption. In terms of methodology, preemption was assessed through self-report; this approach has several inherent problems. First, persons may be too phenomenologically close to their intentions to be able to evaluate the degree to which they recall or do not recall them. Second, in considering the question of relative focus on intention and outcome, subjects may have "filled in" information missing from their initial recollections of events. In other words, the questionnaire probe may have acted as a cue to further recall. Third, because of the obvious moral issue involved in the question of whether one is

aware of one's intentions, subjects may have experienced a subtle experimental demand and may have responded by reconstructing or guessing at their past intentions when in fact they could not clearly recall them. This demand characteristic may have also been responsible in part for males' report of increased attention to the intentions behind their everyday value violations.

A more objective assessment of recall of intentions and outcomes might be considered in order to circumvent these problems. For instance, subjects' written notes of the remembered event could be coded for relative recall of intentions and outcomes. The problem with this method is that subjects' records can *prima facie* be expected to include more about the objective event than about subjective intentions. A cursory examination of the records obtained in the present study confirms this expectation. Thus, subjects are likely to recall more about intentions than their written notes or accounts of remembered personal events would reflect.

Alternatively, subjects could be directly asked to record as much information about intentions and outcomes as they could recall. However, this method would lead to the same problem of demand characteristics mentioned earlier. Clearly, a methodological approach to the measurement of preemption in autobiographical memory is not easy to devise.

Aside from the possible methodological reasons for the lack of preemptive effects, it may be that preemption of intention information occurs only when it comes to perceiving, remembering, and judging the

behavior of others, rather than the behavior of oneself. One's access to information about one's own intentions is obviously much greater than one's access to information about others' intentions. The process of discerning the intentions of the other requires more information processing than does the process of recognizing one's own intentions. Therefore, the process of discerning the other's intentions is likely to be more vulnerable to preemptive processes.

The present discussion of preemption in autobiographical memory points out an interesting paradox in the broader phenomena of evaluations of the behavior of self versus other. The well-established "fundamental attribution error" (Jones & Davis, 1965) is for persons to attribute the cause of another person's behavior to a trait of that person while attributing the causes of their own behavior to the situation more than to their intentions. Paradoxically, however, persons have considerably less access to information about the intentions of others than to information about the intentions of self.

Methodological limitations notwithstanding, the present findings thus suggest that persons generally have relatively equivalent recall of information about the intentions behind their past behavior and information about the outcomes of this behavior. Although clear assessment of this dimension of memory is difficult, further research might compare persons' memories of extremely positive and extremely negative events in important and unimportant domains: It may be that preemption of one's own intentions would only occur in the case of

events that had extremely traumatic outcomes in domains of great importance. On the other hand, such situations might actually prompt a more intense search for information about why one acted as one did.

Domain Importance and Latency as Recallability

The present study focused mainly on subjective, experiential indices of recall. However, recall latencies were also examined, following the example of Robinson (1976, 1980). The findings for the other temporal variable examined--memory dating--will be discussed in the context of the findings on recall latencies.

The present data concurred with Robinson's finding that event valence did not affect accessibility as measured through speed of recall. However, the present data did not support Robinson's (1980) finding that emotional intensity increased speed of recall: Events from important domains--domains of behavior about which persons have relatively intense feelings--were not found to be recalled significantly more quickly than events from unimportant, emotionally neutral domains. Only one latency effect was obtained in the present study: Memories of relatively rare events were found to take significantly longer to access than memories of relatively commonplace events.

Given the clear role that domain importance was found to play in recallability as assessed in terms of experiential variables such as vividness, confidence of recall, and the like, what do the null findings for domain importance and latency suggest? First, null findings, of course, cannot be definitively interpreted to indicate

the absence of an effect. Furthermore, it is possible that events recalled in high and low importance domains in the present study did not differ from one another in emotional intensity to the same degree as did the emotionally intense and neutral memories studied by Robinson (1980).

However, it may be that experiential differences in emotional and imagistic vividness, confidence of recall, frequency of recall, and remembered complexity are more sensitive, subtle indicators of recallability than are recall latencies. Barring large differences in latency of recall--differences large enough to be not only statistically significant but also subjectively experienced--it may be that accessibility as determined by recall latency is not an ecologically valid approach to assessing relative recallability of autobiographical memories.

Although significant differences in recall latency based on a few seconds--as were found both in the present study and in Robinson's (1980) study--may indicate interesting differences in storage and retrieval processes for various contents stored in memory, such differences are unlikely even to register in the experience of the remembering subject, and so may have little impact on the practical ramifications of differences in recallability.

The finding of longer latencies for production of memories of rare events versus commonplace events at first glance simply seems to add support to the claim that novelty was successfully manipulated in the present study. Subjects selected memories that were more quickly

or readily available to represent commonplace events, and appeared to have combed through their memories to find events considered more unusual or rare.

However, based on previous researchers' claims that novel, unique, highly distinguishable events are more recallable (Linton, 1982, 1986; Wagenaar, 1986; White, 1982), it might have been predicted that rare events would be recalled more quickly than commonplace events. That the reverse was found suggests several points and possible explanations. First, it may be that the high frequency, commonplace, everyday events accessed in the present study were more representative of salient, everyday events than of relative obscure daily events, and that their saliency and familiarity made them more readily accessible than relatively rare events. What this suggests is that the relation between event frequency and event memorability is not a simple one: High frequency, everyday events may be highly distinguishable as well as relatively obscure.

Second, it may be that the process of selecting a relatively rare event from the pool of autobiographical memories--that is, the process of making novelty judgments about memories--accounts for the longer latency for rare events.

Third, it may be that recall in terms of vividness and recall in terms of latency are inversely related: It may take longer to reach the internal criterion of recall for a vivid memory than for a relatively nonvivid memory.

Fourth, there may be a confound between novelty and memory age, and older memories may take longer to access than relatively recent memories. The findings on memory dating suggest that memories persons select as representing relatively rare events differ systematically in age from those selected to represent commonplace memories: Rare events were significantly older than commonplace events. This finding makes some intuitive sense. By definition, there must be fewer relatively recent rare events than relatively recent commonplace events.

However, the memory dating and latency data together may indicate something less intuitive and more intriguing about autobiographical memory, namely, that the manner in which autobiographical memory is organized requires a longer search for older events. Thus, for instance, if autobiographical memory is organized in a fashion that mirrors the actual chronology of events, older memories would be expected to require a longer retrieval period.

In sum, as assessed in the present study, domain importance does not appear to affect accessibility as determined by latency of recall. Although differences between the present study and that of Robinson (1980) in the operationalization of importance and emotional intensity may have contributed to the null results, it may be that recall latency is not directly related to other indices of recallability, or may not be as sensitive to differences in recall as are more qualitative indices.

Summary: The Relation Between Present Findings
and Past Research on Recallability

As was noted above, the present findings appear to qualify many of those presented previously by researchers in autobiographical memory. For instance, the present finding of a complex interactive relationship between domain importance and novelty corrects the previously held conclusion that simple rarity or uniqueness is sufficient to make a memory distinctive.

Yet, in other ways, the present findings also confirm the data and conclusions of these previous researchers. Certainly, on the broadest level, the findings of the literature suggested that personal importance or related variables play a significant role in recallability (Fitzgerald, 1986; Linton, 1982, 1986; Robinson, 1980; Rubin & Kozin, 1984; Wagenaar, 1986; White, 1982). In addition, several studies demonstrated interrelationships between the independent factors influencing autobiographical memory (Linton, 1986; Rubin & Kozin, 1984; Wagenaar, 1986).

In addition, Linton's (1986) assertion that important, emotionally salient events must be "relevant" to present concerns in order to be accessible to memory is reflected in the present results. Because the memories elicited in the present study were of events from domains of behavior found to be currently important or relatively unimportant to the individual, events recalled for important domains can be considered relevant to the subject at the time of recall--if not in terms of specific sequences of life plans or goals, as Linton (1975) and White (1982) define importance, then at least in terms of

trends in values and concerns. Thus, the present findings reflect differences in the recall of events which are drawn from categories of personal behavior which are different degrees of current importance (emotional salience) and relevance to the person.

Although the present findings demonstrate recallability differences for memories drawn from domains of current high and low importance, another question is that of whether the present results also shed light on the issue of variability in recall of events that were known to be experienced as important and emotionally intense or relatively unimportant at the time they occurred. The results described by Linton (1975, 1982, 1986) and White (1982) are based upon this sort of data; furthermore, Linton (1982) and Robinson (1980) have shown that emotional intensity and importance ratings can change over time.

An answer to this question can be offered in the following way: Given that persons are believed to distinguish important from unimportant domains as a result of socialization experiences that occur over time (Higgins & King, 1981; Higgins, King, & Mavin, 1982), it is fair to assume that in most cases, domains that subjects reported to be important and unimportant at the time of assessment were also important (or unimportant) at the time of the occurrence of the events that they recalled from these respective domains. Thus, it is probably fair to assume that the specific events that subjects in the present study recalled in response to cues for important and unimportant domains were also experienced at the time they occurred as

important and unimportant, respectively. This assumption is further supported by the data on subjects' dating of remembered events: To the extent that subjects dated their memories fairly reliably, the overall mean event age was 2 days, and the modal age was between zero and 5 days. It is unlikely that most individuals' sense of personally important versus unimportant domains of behavior shifts dramatically within such a short period of time.

Nevertheless, strictly speaking, in the absence of importance ratings of events at the time of occurrence, the findings of the present study cannot definitively qualify the findings of studies such as Linton's (1982, 1986), Wagenaar's (1986), and White's (1982), all of which involved immediate ratings of an event's importance or of the subject's emotional intensity at the time of the event, and correlations of these ratings with later recallability.

Another difference, briefly mentioned earlier, between the present study and those of Linton (1982, 1986), White (1982), and Wagenaar (1986) involves the operationalization of event novelty or distinguishability, and the range of novelty utilized in the respective studies. Recall that Linton and Wagenaar required that an event be "unique and fully distinguishable" from other events before including it in their respective studies; nevertheless, they found that they often had difficulty recalling events that at the time seemed at least minimally distinctive. White (1982), on the other hand, attempted to select events randomly, without regard to event distinctiveness. In the present study, subjects were asked to recall

events that they considered relative commonplace, everyday events, as well as rare and unusual events. Obviously, the commonplace, everyday events included in the present study were of necessity salient enough to be recalled--and not only recalled, but recalled as the first memorial association to a verbal cue.

Thus, of necessity, the memories that constituted commonplace, everyday events in the present study could not include relatively or completely forgettable events, as could those included in the previous studies mentioned. Therefore, the results of the present study may have more to say about differences between relatively rare events as compared to commonplace, well-remembered and easily accessible events than about differences between rare events and the sorts of obscure, mundane, repetitive everyday events sampled by previous researchers, particularly White (1982). In other words, the present findings may speak to differences in the recallability of rare, unusual events versus events that constitute the well-known everyday fabric of the person's life context. This point helps clarify the present data, which indicate comparatively high experienced vividness for memories of commonplace events, and may explain the lack of a novelty main effect for the variables associated with recallability.

Nevertheless, this should not be taken to "disqualify" the qualifications suggested regarding the literature's conception of the direct role of event novelty on memory recallability. If anything, the more subtle differences in distinguishability between rare and commonplace events found in the present study suggest that the complex

interactive effects obtained might emerge even more clearly given greater differences between sample memories in the novelty of remembered events.

In sum, the possible differences between the present study and previous studies in the nature of the events and memories examined do not seem sufficient to negate the relevance of present findings to past findings and assumptions. Aside from the specific new findings provided by the present study, the overall pattern of data establishes the need to examine the interactive effect of independent variables on recallability, especially the interactions between domain importance and other more frequently examined factors.

Affective Qualities of Autobiographical Memory

The relative vividness of the recall of emotions associated with past personal events was discussed earlier along with other indices of recallability and will not be discussed in detail again here. Rather, this section will describe two general patterns which involve all three of the affective dimensions examined.

First, the data suggest that whereas domain importance affects relative recall of the emotions experienced at the time of an event, domain importance does not affect the valence or intensity of present feelings about the memory of the event. Nor does domain importance appear to affect retrospective judgments about the desirability of past events. On the other hand, event valence does not play a major, clear-cut role in vividness of recall of past emotions, but is the major determinant of memory pleasantness and event desirability.

Thus, to the extent that pleasantness and desirability may be related to a person's willingness to recall an event, event valence may not be related to the person's ability to recall a past autobiographical event, but to his or her wish, willingness, or eagerness to do so. In a free recall setting, it might be expected that persons would recall a greater number of positive than negative life events, not because negative events are less accessible than positive events, but because persons are simply less eager to recall negative events. This distinction between ability and willingness to recall positive and negative life events has been largely overlooked in the literature to date.

Second, a comparison of the factors influencing emotional vividness, pleasantness, and desirability indicates that recall of past emotions is unaffected by the presence or absence of peers during the act of recall, whereas present feelings about memories and the events these memories represent are affected by the social setting in which one remembers the events. To review, the findings suggest that persons find positive, commonplace events significantly more pleasant to recall than positive, rare events when recalling events while not in the presence of peers; when surrounded by peers, no such difference between commonplace and rare positive events obtains. An additional test of cell means indicated that persons tested in a group experienced positive, rare events as significantly more pleasant than did persons tested apart from their peers. Furthermore, memories of commonplace and rare negative events were not found to differ in

pleasantness regardless of the social setting within which subjects recalled them. Regarding desirability, positive events are retrospectively seen as more desirable than negative events whether one recalls these events in the presence of peers or not; however, the difference between positive and negative is a good deal larger for persons making these judgments while in the presence of peers.

These findings add support to the distinction drawn above between the ability and the willingness to recall positive and negative events. For persons recalling events while surrounded by peers, positive events are enhanced in their pleasantness and desirability, whereas negative events are acknowledged even more unwillingly than they are when recalled while one is not around peers. The notion of the covert social comparison and self-presentation that may go on when persons recall life events in a group with other persons might explain the tendency to emphasize positive, relatively pleasant memories relative to negative, relatively unpleasant memories as found in the present data. Persons recalling life events while sitting in a group of peers anticipate the situational demand to present themselves and compare themselves to others, and thus may be more eager to recall pleasant, desirable events than relatively unpleasant, undesirable events.

In sum, for the three affective variables as a group, there were two major patterns regarding emotion and autobiographical memory:

1. Domain importance affects recall of emotions, whereas event valence affects the nature of the affective experience of remembering

the events and the nature of the affect-laden judgments made about desirability of past events.

2. Recall of emotions associated with events is unaffected by the social context of remembering, whereas the pleasurability experienced in recalling these events and the judgments of desirability made about these events are affected by social context.

Together, these findings point to the important distinction between the ability to recall and the willingness to recall life events, and the different role played by importance and valence in ability and willingness to recall, both of which determine which memories are most likely to be remembered.

Domain Importance and Consequentiality

Do events from important domains have greater immediate and long-term consequences than events from unimportant domains? Wagenaar's (1986) proposal that salient, emotionally involving events have a greater number of sequelae or "ripples" than do nonsalient, emotionally uninvolved events, and that the greater number of sequelae increases rehearsal and recall of the event, receives mixed support from the present data. Regarding the issue of degree of consequentiality, domain importance did not emerge as a main effect for either event impact or event significance. The immediate impact of an event appears to be determined more by the relative novelty of the event and by the gender of the experiencer, with rare events having more impact than commonplace events and females being more affected by life events than are males.

However, domain importance does appear to play a role in the long-term significance of personal events--once again, by mediating the effects of other variables. To review, females appear to see rare events as more significant than commonplace events, but only when it comes to events from important domains. Males see rare events from low importance domains as more significant than commonplace events from low importance domains and do not distinguish rare from commonplace events in high importance domains.

Thus, the present data do not directly support the notion, adapted from Wagenaar, that important events have greater numbers of sequelae; however, domain importance does mediate the effects of gender and novelty on evaluations of the significance of remembered events.

Regarding the proposed relation between event consequentiality and recallability, the present data suggest that this relation may hold, but only under certain conditions. A comparison between the effects obtained for the five variables related to experienced recall and those obtained for impact and significance suggests the following points of agreement and disagreement:

1. Interactions obtained for event significance and impact are not the same as those obtained for image vividness and confidence of recall. This suggests that the experienced impact or significance of individual events may not directly relate to image vividness and confidence of recall.

2. The finding that rare events are experienced as having more impact than commonplace events corresponds to the finding that rare events are significantly more emotionally vivid than commonplace events when these events are drawn from high importance domains. This correspondence suggests that there may be a relationship between high and low impact events and high and low emotional vividness.

3. For females, high importance rare events are thought about and disclosed more often than high importance commonplace events, are remembered as being more complex than high importance commonplace events, and are experienced as more significant than high importance commonplace events. Although causal relations cannot be ventured, the present data suggest that, in the case of high importance domains, the relative significance and complexity of an autobiographical event may affect the frequency with which the event is spontaneously rehearsed, at least for women.

4. The means in the Significant Importance x Valence interaction for significance are in the same direction as those in the Importance x Valence interaction for frequency of rehearsal discussed in reference to the "Kohler effect": low importance positive events were seen as more significant than high importance positive events, and high and low importance negative events were seen as roughly equivalent, although the differences between the means in this interaction were not significant. The correspondence between these interactions provides further support for the notion that the relative

significance of a personal event may influence the frequency with which memories of these events are recalled.

Several features of the method and data of the present study may limit the validity of the present findings in terms of confirming or disconfirming Wagenaar's (1986) notion of the relation between event importance, event sequelae, frequency of rehearsal, and recallability. First, subjects in the present study were not directly asked to estimate or report the number of sequelae following from each remembered event. Rather, subjects were asked to report the "degree of effect" the event had on them at the time, or the degree to which they changed their behavior in some way as a result of the event (impact); and they were asked to report the importance of the event in their life--the degree to which the event changed or made a difference in their life (significance). Although higher scores on either of these dimensions could correspond to greater number of sequelae, neither scale directly asked for a report of frequency.

Second, the self-report nature of the assessment tool used in the present study does not allow for objective verification of the significance and impact of specific past events. Thus, what is assessed here is the subjective experience of impact and significance of past events. However, Wagenaar (1986) himself did not employ an objective measure of number of sequelae with which to test his hypothesis; in fact, he did not test the hypothesis at all. The present study at least makes an initial empirical assessment of his hypothesis.

Third, as was discussed earlier, the memories examined in the present study are of events from important and unimportant domains and are not necessarily memories of important and unimportant events. Thus, the events represented in the memories examined in the present study may not be strictly comparable to the events employed by Wagenaar, which were each rated in terms of their emotional intensity shortly after the time they occurred. However, arguments presented earlier suggest that, in fact, the stimulus events examined in Wagenaar's study and in the present study are likely to be fairly similar.

Fourth, as was also noted earlier, all the memories elicited from subjects in the present study were at least sufficiently recallable to be remembered by subjects as a first response to a cue, and thus the baseline recallability of the memories employed in the present study may be higher than that in Wagenaar's study. A more direct and powerful role might have been found for domain importance in the relation between consequentiality, rehearsal, and recall had there been greater range in event recallability.

Despite these considerations, the present data provide some preliminary indications that the relation between event consequentiality, rehearsal, and recall may not be as simple and direct as that proposed by Wagenaar (1986).

Domain Importance and Event Frequency and Predictability

The clearest finding across the three variables assessing event

frequency and predictability was that relatively commonplace events are experienced as more expected and judged to be more likely than relatively rare events. Along with the highly significant main effect for novelty on subjects' judgments of the novelty of their cued memories, the novelty effect on expectancy and likelihood strongly suggests that novelty was successfully manipulated--in other words, that memories of relatively rare and relatively commonplace events can be cued with some degree of accuracy.

Needless to say, this subjective method of assessment is no substitute for objectively assessed frequency of life events. In addition, the literature to be reviewed shortly on memory for frequency suggests that certain factors may affect the accuracy of frequency memory. However, this literature also provides a great deal of evidence that frequency memory is often extremely accurate. Given the gross level of frequency judgment that the present novelty cueing method requires of subjects, it is likely that cued production of relatively rare and relatively commonplace events was fairly accurate.

Aside from providing validation of the novelty cueing procedure, the novelty effect found for expectancy and likelihood is interesting in that it confirms that persons operate on the basis of the principle that the best predictor of future behavior is past behavior. In addition, this dictum does not appear to be significantly modified by the importance of the domain within which the behavior occurs. In other words, persons do not appear to predict that they will be more likely to engage in behavior from important domains than behavior from

unimportant domains, nor do they view important behavior as necessarily more expected in general than unimportant behavior, or vice versa. Nor do clear-cut importance effects emerge when valence is added as a factor: With the exception of two significant pairwise comparisons embedded in the marginally significant four-way interaction found for likelihood, the valence of the remembered behavior was not found to interact with domain importance. In other words, persons do not appear to predict that they are any more likely to repeat positive behavior from important domains than positive behavior from unimportant domains; nor are positive behaviors from important domains retrospectively seen as any more expected than positive behavior from unimportant domains. Likewise, negative important behaviors and negative unimportant behaviors do not appear to be differentially expected or predicted.

Of course, null findings cannot serve as definitive proof that a factor has no significant effects. However, to the extent that the lack of significant findings suggests the absence of a clear-cut role for domain importance in judgments of expectancy and likelihood, the findings may shed some light on the processes by which domains come to be salient. Recall that Higgins and his colleagues (Higgins & King, 1981; Higgins, King, & Mavin, 1982) argued that the relative accessibility of constructs depends upon the frequency of a construct's activation in the person's life. The present autobiographical data suggest that frequency of activation alone cannot account for construct accessibility: If frequency of

activation were the sole determinant of salience, differences in reported novelty, expectancy, and likelihood would have emerged as a function of domain importance. The lack of such data suggests that domains can become salient or important, not only or even mainly through frequency of activation, but, rather, through the meaningfulness or significance of experiences in those domains. The main effect found for novelty on event impact and significance supports this point: As has been described earlier, relatively rare and infrequent events were found to have greater impact and generally more significance than relatively commonplace, high frequency events.

This interpretation makes sense from the perspective of the literature on child-rearing and parenting (see Maccoby & Martin, 1983, for review of this literature): Effective parenting should, by definition, limit the frequency of further instances of bad behavior in a domain through the impact of the emotional intensity of the parent's intervention and through the clarity of the meaning of the parent's constraint upon the child. Likewise, research by Lepper and colleagues (Lepper & Greene, 1978; Lepper, Greene, & Nisbett, 1973) demonstrates that regularly reinforcing a child's positive behavior with rewards actually reduces the spontaneous frequency of that behavior. Thus, for the developing child and adolescent, it may be that behaviors in important domains elicit fewer but more definitive, consequential, and emotionally intense socialization interventions on the part of parents. And if Kohler (1938) is correct, exemplifications of valued domains come to be seen by the adult as

objectively required and therefore unremarkable, suggesting that persons may not experience their behavior in such domains as more frequent than behavior in low importance domains.

The literature on the cognitive and emotional effects of traumatic stress (Horowitz, 1976, 1979; Roth & Cohen, 1986) adds further support to the notion that intensity of activation may have as much or more to do with construct accessibility as does frequency of activation. This literature documents the tremendous impact that a single traumatic event, such as a rape, can have on relative accessibility of constructs.

In sum, the present data suggest that subjectively experienced event frequency, and not domain importance, has the clearest effect on judgments of the expectedness of remembered events and of the likelihood of similar events in the future. This is not to say that relative novelty is the only factor that affects expectancy and likelihood judgments. For instance, valence, in combination with gender, affected expectancy judgments: Females appear to expect that they will behave in positive ways more often than in negative ways, whereas males are not as sure that they will exemplify values more often than they violate them. Presence or absence of peers during recall and evaluation of memories also showed effects on expectancy and likelihood. However, overall, event novelty has the clearest impact on these retrospective and prospective frequency judgments. This finding, and the lack of a clear-cut role for domain importance in these judgments, suggest that intensity and not frequency of

activation may play the crucial role in the process by which domains come to be significant or relatively nonsignificant to the individual.

Domain Importance, Autobiographical Memory, and the Self

One of the guiding premises of the present study is the notion that if autobiographical memories largely constitute the person's conception of self, and if certain events and behaviors are more important than others for any given individual, it should be expected that domain importance will affect the attributes of memories that constitute the self. Nowhere in the data is this premise more directly supported than in the finding that domain importance mediates the effect of valence on the experienced self-descriptiveness of various autobiographical memories. Persons experience memories of their positive, value-exemplifying behavior as significantly more descriptive of self than are memories of negative, value-violating behavior, but only in domains that matter to them. Memories of positive and negative behaviors and events in low importance domains are not experienced as differentially self-descriptive. In addition, memories of value-violating behavior in high importance domains are perceived as significantly less self-descriptive than memories of value-violating behavior in low importance domains.

These findings highlight the role of affect in self-relevant/self-referent processing and empirically demonstrate the point argued early in the present paper: Persons engage in judgments about the relative self-relevance of behaviors and events only when

the behaviors and events in question represent domains of personal importance. In other words, in order for information to be processed in terms of the issue of self-relevance, this information must first be personally meaningful; otherwise, the information simply will not be differentiated in terms of categories relevant to self. The present study demonstrates that personal meaningfulness can be construed in terms of the degree of evaluative emotion experienced about behaviors in various domains. This domain importance appears to influence self-referent judgments through mediating differentiation on the basis of other variables such as event valence.

Put another way, Markus (1977; Markus & Sentis, 1982), Rogers et al. (1977), and others who have written about self-relevance in cognition and memory essentially describe a one-step process, in which the person simply processes certain contents as relevant and others as irrelevant to self. It is implied by these authors that persons continually engage in such processing. The present data suggest that self-referent processing and judgments about self-relevance are two-step processes. Information is initially processed in terms of relative personal importance. Information that is experienced as important then becomes available for processing in terms of self-relevance. Information that has little personal importance fails to be processed self-referentially beyond the level of assessed importance. In the present study, subjects assessed the self-descriptiveness of autobiographical memories of events in high and low importance domains; only in the case of events from high importance

domains did subjects go on to differentiate these remembered events in terms of valence.

Thus, the present study demonstrates that emotion-based personal importance plays a central role in initiating self-referential processing.

Summary of General Patterns and Specific Findings

In the pages above, a large number of complex findings have been described and discussed. The present section briefly summarizes the general patterns for the five independent variables. Areas for further exploration are then discussed.

Domain Importance

The major pattern for domain importance has been articulated throughout this and the previous chapter: Domain importance mediates the influence of other independent variables on the attributes of autobiographical memories. Domain importance has its most clear-cut effects on dependent variables associated with memory recallability and on the self-descriptiveness of memories.

Novelty

As was noted earlier, novelty did not emerge as a main effect for the five variables associated with the subjective experience of recallability, but had an impact on all five of these variables and played a part in 7 of the 11 significant interactions obtained for these variables. Under certain conditions, commonplace events were remembered better than rare events, whereas under other conditions,

rare events exceeded commonplace events in recallability. Likewise, novelty effects on other dependent variables, such as self-descriptiveness, age-relatedness, and significance, varied on the basis of interaction with other variables.

Nevertheless, of the five independent factors, novelty accounted for the largest number of unqualified or ordinally qualified main effects. All of the main effects obtained for novelty make fairly clear intuitive sense, though some, particularly those obtained for the temporal variables "recall latency" and "memory dating," suggested interesting issues regarding the organization of autobiographical memory.

Thus, it is clear that novelty has a tremendous influence on autobiographical memory. It is equally clear that this influence is mediated by the operation of other equally powerful factors, especially domain importance.

Valence

Two general patterns emerged for valence. First, of the 14 comparisons that involved direct tests of the differences between the means for positive and negative remembered events, 9 of these found positive remembered events significantly greater than negative events, 1 found negative events significantly greater than positive events, and 4 found no significant differences between positive and negative events on their respective dependent dimensions. For the five qualities associated with recallability, memories of positive events exceeded memories of negative events. Informal examination of the

differences between the means for the positive and negative conditions in interactions in which positive and negative events were not directly contrasted suggests that this pattern of positive over negative would not be substantially altered by such direct tests. Thus, the present data do not support suggestions from related findings in the cognitive literature that negative autobiographical events might be generally more memorable than average positive events (Fiske, 1980; McArthur & Baron, 1983; Woll & Martinez, 1982; Zajonc, 1980).

On the other hand, valence did not emerge as a main effect for any of the recallability variables, or for self-descriptiveness and consequentiality. Valence emerged as a qualified main effect for expectancy and likelihood. Valence had an unqualified main effect only for variables where such an effect would be highly expected: memory pleasantness, event desirability, perceived match between intentions and outcomes, evaluations of intentions, and perceived control over events. Thus, the effects of valence, although predominantly in the direction of positive over negative, are not simple and only emerge in the context of other independent variables. Valence clearly plays a central part in autobiographical memory: 64% of the significant interactions involved valence as a factor, including 7 of the 11 significant interactions pertaining to recallability.

The second general pattern of interest to emerge for valence was that, in interactions with other variables, differences in levels of

the other variables emerged mostly within the positive condition and rarely within the negative condition. Of the 13 two- and three-way interactions that involved significant pairwise differences in the means for levels of other variables within valence conditions (e.g., differences in means for commonplace and rare events within positive and negative valence, or a 2 x 2 interaction of Novelty x Domain Importance within valence conditions), 10 of those differences emerged within the positive condition and only 3 emerged within the negative condition.

This pattern suggests that negative emotional valence in remembered events may preempt differentiations between these memories on the basis of other dimensions. In other words, it appears that negativity in a memory "floods the field," overruling the effects of the other independent factors that display their effects in the case of positive remembered events. The data indicate that this effect can hold true for differentiations based on domain importance, novelty, gender, social context, and combinations thereof. Negativity may thus operate in many instances as a "phenomenological equalizer," blurring distinctions between memories that would otherwise emerge on the basis of the effects of other variables.

Gender

The gender differences found for recallability variables were discussed earlier. In addition to these differences in frequency of recall, in attunement to complexity, and in the types of memories that are most imaginatively vivid and confidently recalled by males and

females, respectively, males and females appear to differ in the types of memories they find more or less significant, in their expectancies regarding their proclivity to behave in a positive versus a negative fashion, in the degree to which they differentially recall intentions and outcomes, in the experienced self-descriptiveness of memories of commonplace and rare events, and in the age of events they access in the case of positive memories.

As was briefly outlined, the gender differences appear to fall into two patterns. First, women appear to be more occupied with memories of the past and more sensitive to the impact of life events than are men. The expectancy findings make sense in this context: If women spend more time reflecting upon and talking about life events than do men, and if they are more affected by events involving them as actors, then women may be more likely to behave in positive than in negative ways—they will live with the memorial ramifications of their negative behavior more than will men.

The finding that men give relatively greater attention in memory to the intentions behind their everyday negative behavior further illuminates this distinction between men and women. It may be that this greater attention involves a process of rationalization, in which males seek out the good intentions or mitigating circumstances behind their bad behavior. Recall that the match between intentions and outcomes was found to be significantly poorer for negative events than for positive events, and that perceived control over events was experienced as significantly poorer for negative versus positive

events. On the other hand, males may perceive themselves as having less adequate impulse control than do women, and the enhanced attention to intentions may reflect an earnest attempt to develop greater control over behavior.

The second major pattern that distinguishes males from females is that females appear to be prone to distinguishing features of memories and events in high importance, emotionally charged domains, whereas males demonstrate special sensitivity to memories and events in low importance, emotionally neutral domains. As was noted earlier, this difference may be based on differences in males' and females' levels of comfort with emotional arousal. Moreover, females may experience emotional arousal as a cue to attend to, differentiate, and encode events thoroughly, whereas males may at times experience emotional arousal as a cue to limit memorial processes. Likewise, females may overlook details of events and memories when these hold little personal importance, while males may be more comfortable with these relatively less important events and memories, and thus, may be more given to attend carefully to such events.

Naturally, these formulations must be taken in the spirit in which they are offered: as preliminary hypotheses designed to account for some unexpected and intriguing data. A thorough review of findings bearing on gender differences in emotion and cognition, impossible within the space of the present essay, would need to be conducted to set the present findings in the context of past work on

gender differences. However, it should be noted that to date no work has been published on gender differences in autobiographical memory.

Social Context

Earlier in this discussion a model was proposed to explain the social context effects derived for recallability variables. The essence of the model is the notion that persons in groups of coactive others engage in a silent, covert process of social comparison, both as a function of the habitual revision and maintenance of self-concept as well as in anticipation of self-presentation. Does this model hold for the remaining social context findings?

The patterns of the data for social context effects on pleasantness, desirability, expectancy, likelihood, age-relatedness and self-descriptiveness generally suggest that the model does hold. The pattern of findings for memory pleasantness suggests that persons recalling life events while in the presence of others do not find memories of commonplace and rare positive events differentially pleasant, whereas persons recalling events apart from peers find memories of commonplace positive events most pleasurable. In line with the social comparison model, persons recalling autobiographical events in the presence of others may be happy to recall as many positive events as they can, so as to buttress self-esteem in the process of social comparison and in preparation for self-presentation. Persons recalling life events apart from peers may not feel as pressured to recall positive events in their lives, and so have the phenomenological "luxury" of making differentiations between

commonplace and rare events regarding memory pleasantness. In line with this interpretation, group-tested subjects were found to experience rare positive events as significantly more pleasant than did individually tested subjects. Thus, the lack of differentiation between commonplace and rare positive memories by subjects tested in a group appears due to an enhancement of the pleasantness of positive rare memories for these group-tested subjects.

The patterns for desirability complement those found for experienced memory pleasantness. Group-tested subjects described positive autobiographical events as more desirable than did individually tested subjects and described negative events as less desirable than did individually tested subjects. In addition, these retrospective descriptions of the relative desirability of positive and negative events were a good deal more polarized for persons recalling events in the presence of others than for those recalling events apart from peers. Thus, persons engaging in autobiographical recall, in the presence of others appear to find positive life events highly pleasant to recall regardless of differences in the relative uniqueness of these events, and tend to see positive past events as having been a great deal more desirable than negative events. Although essentially the same pattern obtains for persons recalling life events in isolation from peers, the degree of emphasis on positive life events for persons recollecting in a group context is significantly greater than that experienced by persons recalling their past behavior while apart from peers.

The test format effects for expectancy and likelihood are less clearly supportive of the notion of the impact of social comparison effects. In fact, for expectancy, one pattern of differences between means seems almost opposite of what would be predicted from this model: Subjects tested individually estimated positive commonplace events to be significantly more expected than negative commonplace events, whereas group-tested subject made no such distinction. From the perspective of the proposed model, it might have been predicted that group-tested subjects would make such distinctions, because the majority of the findings suggest that the presence of peers leads to a memorial emphasis on positive commonplace events. In addition, individually tested subjects were found to judge remembered positive autobiographical events as significantly more expected than did group-tested subjects. However, consistent with the model and with the findings for memory pleasantness, group-tested subjects judged positive rare events to be significantly more expected than negative rare events, whereas individually tested subjects did not differentiate these types of events.

The likelihood findings are no more clear than those for expectancy. Although none of the pairwise comparisons were significant, the interaction of Importance x Test Format suggests that subjects tested in a group saw autobiographical events in low importance domains to be more likely than events in high importance domains, whereas individually tested subjects saw high importance behaviors as more likely than low importance behaviors. In addition,

the direction of the means suggests that individually tested subjects saw events in high importance domains as more likely than did persons tested in a group, whereas these group-tested subjects saw low importance events as more likely than did individually tested subjects.

The general lack of confirmation of the notion of social comparison and self-presentation in the test format effects for expectancy and likelihood may suggest that not all aspects of the person's thinking about memories of life events are subject to the same influences, or respond to these influences in the same way. On the other hand, as was discussed in the section describing the results of this study, neither of these interactions provided statistically unambiguous findings. Certainly, future investigations of social context effects on autobiographical memory would need to examine the impact of these effects on persons' retrospective expectancy estimates as well as on their likelihood predictions, as evidence of such effects would provide intriguing suggestions about ways in which memories are reconstructed and personal futures are anticipated.

The findings for social context effects on self-concept variables provide evidence in support of both Zajonc's (1965) social facilitation explanation and the social comparison explanation of these effects. Subjects who recalled autobiographical events while in the presence of others appeared to regard memories of commonplace, everyday events as significantly more self-descriptive than memories of relatively rare, unique events. This finding seems better

explained by the notion of social facilitation of the dominant response than by the notion of social comparison. There is some evidence, reviewed above, that commonplace events are generally "easier" to access than rare events, making memories of commonplace events the dominant memorial response in comparison to memories of rare events. Evidence did not emerge on the self-descriptiveness scale to support the notion that persons remembering autobiographical events while in the presence of others regard positive and negative commonplace events as differentially self-descriptive, a finding that would be predicted by the social comparison/self-presentation hypothesis.

However, the data on perceived age-relatedness of remembered events again adduce support for this latter explanation of group effects. Persons recalling life events while in the presence of others judged commonplace positive events to be significantly less related to their age at the time the event occurred than were relatively rare events, and, moreover, judged commonplace positive events to be significantly less related to age than did persons recalling life events while apart from peers. These findings seem to suggest that persons recalling life events while in the presence of others tend to attribute their positive, everyday past behavior to enduring traits in themselves rather than to the relatively impersonal influences of developmental stages.

In sum, although the empirical support is not unilateral, the large majority of the patterns obtained for the nine variables for

which social context effects emerged support the notion that a process of covert social comparison and self-presentation may underlie these effects. Again, this is no more than a post-hoc hypothesis meant to generate ideas for further research in the area of social context effects on autobiographical memory.

On a broader level, it is somewhat ironic to note that this investigation began with an exposition of the intimate relation of memory of life events and self-concept and that unexpected effects were obtained that conceptually resemble those elucidated by researchers whose expressed goal has been to document the manner in which the presence of others may modify behavior (Zajonc, 1965, 1966), especially through the mediational effects of processes of self-evaluation and self-presentation (Bond, 1980; Goffman, 1957, 1967).

Along these lines, the present findings also speak to the issue of the degree to which autobiographical memory is reconstructed to serve some purpose at the time of recall (Greenwald, 1980). Clearly, if social context affects the vividness, confidence of recall, remembered complexity, pleasantness, and self-descriptiveness of life memories, as well as the judged desirability, estimated expectancy, predicted likelihood, and perceived age-relatedness of remembered events, then it can be argued that autobiographical memory is at least to some extent reconstructed. Furthermore, the overall pattern of findings suggests that autobiographical memory may be reconstructed in the presence of others in a manner that enhances the rememberer's self-esteem--a finding anticipated to some extent by the related

arguments of Greenwald (1980) and more recently addressed in the related empirical work of Ross (1988) on recall of personal attributes.

The evidence for social context effects also partially addresses the issue of where in the memory process factors that influence autobiographical recall wield their influence. That autobiographical memories appear to differ when recalled in the presence of others versus when recalled apart from others suggests that autobiographical memory is affected by aspects of the retrieval process. Other evidence described above provides some indication that influencing factors may have their impact on rehearsal processes, and many of the data are also consistent with the notion that factors affect encoding processes. However, the social context effects provide the clearest indication, albeit post hoc, that one of these three points of potential influence on autobiographical memory can be a window of influence.

Directions For Future Research

The flavor of the discussion of the numerous findings obtained in the present exploration of the effects of domain importance on autobiographical memory has ranged from affirmation to speculation, from essential confirmation of a strong hunch or informal prediction to post-hoc reasoning about some unanticipated but intriguing effects. What has hopefully been communicated throughout the material is that the factors that influence autobiographical memory do so in complex yet orderly ways and that the relative personal importance of the

behavior domain represented in autobiographical memories plays a central role in determining the qualities of these memories.

The specific findings suggest numerous directions and topics for further research. Many of these have been noted in the discussion of these findings and will not be repeated here. The present section will focus largely on avenues of exploration that would have important methodological ramifications for the continued study of the influence of domain importance and other factors on autobiographical memory.

It would be both empirically interesting and methodologically useful to develop objective indices of persons' relative access to their autobiographical memories, indices that are both more meaningful and ecologically valid than small but significant differences in recall latency, yet which are more reliable than self-report. One avenue of approach might be to determine whether or not there is a relation between duration or patterns of eye fixation and recall of vivid versus nonvivid memories. It may be, for instance, that highly vivid memories produce longer and more stationary patterns of eye fixation than do less vivid memories.

Aside from offering a more objective adjunct assessment of memory vividness for research purposes, such a finding could have important ramifications in the practice of clinical interviewing, where it is often crucial to distinguish occasions when persons are actually gaining memorial access to old events versus when they are confabulating "memories" in order to please or appease the interviewer. In a different sensory modality, Alpert (1982; Alpert &

Anderson, 1977; Andreasen, Alpert, & Martz, 1981) has developed an objective assessment of flat affect in schizophrenia based on patterns of vocal modulation. This assessment technique has been found highly reliable in differentiating flat affect schizophrenia from disorders such as depression, which often closely resemble the affective deficits of this form of schizophrenia. In normal practice, such diagnostic differentiations are based on clinical judgment, which may vary widely in accuracy depending on the skill and experience of the clinician. In addition, clinical judgments are largely guided by the self-reports of patients.

Another approach to a more objective assessment of recall of autobiographical memories might be to have persons recall and record as many details about the remembered event in as many information categories as possible (i.e., as in Wagenaar's, 1986, use of the standard journalistic categories who, what, when, where, how, and why). Event details could then be coded and counted and an accessibility score derived. Yet another approach might be to have persons recall as many detailed memories as they can in response to category cues such as high and low importance domains, or in other categories of interest. The average frequency and level of detail of the memories produced could then provide an index of vividness.

These two methods of objective recallability assessment hold some promise but also present some obvious problems. For one, the level of detail with which a person can describe memories, especially in a written format, may be confounded with intelligence or verbal ability.

Moreover, these methods would need to take account of the distinction between accessibility as evinced by quantity of memories recalled in a category versus the imagistic and emotional intensity of the memories recalled.

Thus, it may not be entirely possible to escape the limitations of subjective report when assessing memory vividness or, more broadly, recallability, especially when independent records of the remembered events are unavailable. However, another way to assess the quality of autobiographical recall without engaging subjects in the laborious procedures taken up by Linton (1975), White (1982), and Wagenaar (1986) might be to gain access to naturalistic personal records and compare the contents of these to the contents of later recall. Diaries, letters, and date books may all provide an objective if not entirely controlled data base for evaluating recall in various domains.

The present study documents a number of interesting effects on largely subjective aspects of personally relevant memories. The study to be presented next affords an opportunity to assess more objectively the effects of domain importance on memory of materials, which vary in their importance for individual persons.

CHAPTER III

THE EFFECTS OF PERSONAL IMPORTANCE ON MEMORY FOR FREQUENCY OF OCCURRENCE

Introduction

In the past several years a good number of memory researchers have sought to describe and explain persons' memory for the frequency with which events occur. Studies have examined this memory ability across a wide range of conditions. However, virtually none of this work has looked at how differences between persons in the relative salience, meaningfulness, or importance of various stimuli may enhance, diminish, or bias frequency memory for these stimuli. More specifically, little work has explored the ways in which individual differences in the relative importance of social behavior domains may affect memory for the frequency of occurrence of representations of these domains.

This chapter seeks to explore the effects of individual differences in the relative importance of behavior domains on a cognitive ability traditionally explored without reference to such individual differences--memory for frequency of occurrence. The chapter will present a critical overview of the current literature on frequency memory and will then report findings that indicate that the relative personal importance or value of various domains of behavior

may affect the perceiver's memory for the relative frequency of representations of these domains.

Memory for Frequency of Occurrence:
Automatic or Open to Influence?¹

The major debate underlying the bulk of the recent research on memory for frequency of occurrence has revolved around the issue of whether or not memory for frequency occurs automatically (Attig & Hasher, 1980; Begg, Maxwell, Mitterer, & Harris, 1986; Fisk & Schneider, 1984; Flexser & Bower, 1975; Greene, 1984, 1986; Hasher & Chromiak, 1977; Hasher & Zacks, 1979, 1984; Howell, 1973; Jonides & Naveh-Benjamin, 1987; Kausler, Lichty, & Hakami, 1984; Maki & Ostby, 1987; Naveh-Benjamin & Jonides, 1986; Rose, 1980; Rose & Rowe, 1976; Rowe, 1974; Rowe & Rose, 1977; Williams & Durso, 1986; Zacks, Hasher, & Sanft, 1982). Hasher and colleagues have presented compelling arguments and data to support the assertion that frequency information is encoded automatically (Hasher & Zacks, 1979, 1984). They and a number of other researchers have demonstrated that intention, practice, chronological age, intelligence, arousal, and depression do not affect persons' capacity for discriminating differences in

¹In the first chapter, automatic cognitive processes were described largely in terms of studies that demonstrated the manner in which cognitive processes could be automatically influenced by the nature of the recent past experience a person had with a particular set of stimuli. Thus, it may seem contradictory to be speaking here of the distinction between automatic processes and processes that can be influenced by experience. However, unlike in the study of automatic processes in attention and social perception (e.g., Bargh, 1982, Higgins, King, & Mavin, 1982; Nielsen & Sarason, 1981), in the study of frequency memory, automaticity has been construed in terms of unsusceptibility to the influences of short- or long-term individual differences.

frequency (Attig & Hasher, 1980; Flexser & Bower, 1975; Hasher & Chromiak, 1977; Hasher & Zacks, 1979, 1984; Howell, 1973; Kausler et al., 1984; Zacks et al., 1982).

However, a number of researchers have presented equally compelling data which illustrate that a number of variables can affect memory for frequency. Richards (1986) found that normal control subjects were generally more accurate than recovering alcoholics in estimating the frequency of their own moods. Birnbaum, Taylor, Johnson, & Raye (1987) have demonstrated that alcohol intoxication reduces the accuracy of frequency judgments. Several studies indicate that concurrent tasks can interfere with frequency processing (Fisk & Schneider, 1984; Greene, 1984; Maki & Ostby, 1987; Naveh-Benjamin & Jonides, 1986; Sanders, Gonzalez, Murphy, Liddle, & Vitina, 1987), and that instructions that manipulate intention to encode and remember frequency can enhance frequency memory (Fisk & Schneider, 1984; Greene, 1984, 1986; Naveh-Benjamin & Jonides, 1986; Rose & Rowe, 1976; Sanders et al., 1987; Williams & Durso, 1986). Moreover, Greene (1986) has demonstrated that the effect of intention to process frequency is most reliable when subjects believe it is important for them to remember frequency information.

Several of these studies have been criticized on methodological grounds (Jonides & Naveh-Benjamin, 1987). In addition, these studies do not address the possibility that concurrent tasks and instructions to attend may affect retrieval and not encoding processes (Greene, 1984): Hasher & Zacks (1979, 1984) only claim that encoding of frequency information is automatic and recognize that a number of

factors may affect retrieval. However, as a group, these studies indicate that the ability to recall or estimate frequency is not entirely unmodifiable or "inflexible" (Naveh-Benjamin & Jonides, 1986); a variety of factors may influence frequency memory.

By far the largest number of studies, and those with the most consistent evidence of influences on memory for frequency, are those which examine the effects of levels of processing (Begg et al., 1986; Fisk & Schneider, 1984; Greene, 1984, 1986; Jonides & Naveh-Benjamin, 1987; Maki & Ostby, 1987; Naveh-Benjamin & Jonides, 1986; Rose, 1980; Rose & Rowe, 1976; Rowe, 1974; Rowe & Rose, 1977). In fact, one study demonstrates that level of processing may have more of an impact than intentions on frequency estimation (Rose & Rowe, 1976).

The notion of levels of processing derives from Craik and Lockhart's (1972) seminal article, in which they argued that the strength of a memory trace is dependent upon the level of perceptual and cognitive analysis of a given stimulus. Attention to physical and sensory features alone represents a relatively shallow level of processing, whereas deeper processing involves recognition of patterns and associations to past learning or personal experience (Craik & Lockhart, 1972). Deeper processing leads to "enriched" or "elaborated" memory traces (Craik & Lockhart, 1972; Jonides & Naveh-Benjamin, 1987). In essence, the more meaningfully the person experiences the stimulus, the more long-lasting the memory trace representing the stimulus and its context.

Researchers studying frequency memory have operationalized processing levels in a variety of ways. Shallower levels of

processing have been induced in subjects by having them code letters into numbers (Rose & Rowe, 1976), count the number of consonants and syllables in each word (Rowe, 1974), identify words containing specified letters (Fisk & Schneider, 1984; Greene, 1984), generate acoustic associates or words that rhymed with the target (Jonides & Naveh-Benjamin, 1987; Naveh-Benjamin & Jonides, 1986; Rose & Rowe, 1976), or rate the relative length (Maki & Ostby, 1987) or ease of pronunciation (Begg et al., 1986) of stimulus words. Deeper levels of processing have been induced in subjects by having them identify whether the word belongs to a specified semantic category (Fiske & Schneider, 1984; Greene, 1984), or by having them mentally form sentences that include the stimulus words (Greene, 1986), generate semantic associates (Jonides & Naveh-Benjamin, 1987; Naveh-Benjamin & Jonides, 1986), create images involving the word's referent (Begg et al., 1986), or rate the connotative strength (Rose & Rowe, 1976; Rowe, 1974), connotative goodness (Rose & Rowe, 1986), imagability (Begg et al., 1986; Maki & Ostby, 1987; Rowe & Rose, 1977), pleasantness, self-relevance, size of referent, or ease of understanding of words (Begg et al., 1986). Although most studies have manipulated processing level through varying orienting tasks, a few studies varied the nature of the stimuli (Begg et al., 1986; Maki & Ostby, 1987); Begg et al. (1986) included items that varied in their emotionality, imagability, and referent size, whereas Maki and Ostby (1987) used high and low familiarity words, as well as geometric shapes.

Across these various operationalizations of processing depth, and across a number of different ways of assessing persons' sensitivity to

frequency (Jonides & Naveh-Benjamin, 1987; Naveh-Benjamin & Jonides, 1986), a reliable finding emerges: As compared with shallower levels of processing, deeper processing leads to frequency estimates which evince enhanced sensitivity to frequency (Begg et al., 1986; Fisk & Schneider, 1984; Greene, 1984, 1986; Jonides & Naveh-Benjamin, 1987; Maki & Ostby, 1987; Naveh-Benjamin & Jonides, 1986; Rose, 1980; Rose & Rowe, 1976; Rowe, 1974; Rowe & Rose, 1977). And although sensitivity to frequency does not necessarily imply absolute accuracy of frequency judgments, most of the above-listed researchers have presented data that suggest that deeper processing leads both to more sensitive discriminations between actual frequencies and more accurate frequency judgments.

Although deep processing leads to improved sensitivity to frequency and to more accurate frequency judgments as compared to shallow processing, when compared to other sorts of processing, deep processing does not always appear to result in greater accuracy. Rowe & Rose (1977) compared frequency judgments made by subjects asked to provide imagery ratings of words, with judgments by subjects asked to make continuous frequency estimates during the experiment's stimulus presentation phase. The imagery rating task led to higher and less accurate frequency judgments than the continuous rating task. These findings corroborated Rose and Rowe's (1976) earlier finding that semantic tasks led to overestimation of frequency. Given the general finding that subjects overestimate the frequency of very low frequency events and underestimate the frequency of higher frequency events (Begg, 1974), enhanced sensitivity to frequency will by necessity be

represented by higher frequency estimates relative to conditions that do not enhance sensitivity to frequency. Data presented by other researchers generally confirm this pattern: Compared to shallow forms of processing, the deep processing which results in better discrimination of frequency and more accurate frequency estimates also results in higher frequency estimates (Begg et al, 1986; Greene, 1984, Experiment 2, 1986; Jonides & Naveh-Benjamin, 1987; Maki & Ostby, 1987; Naveh-Benjamin & Jonides, 1986; Rose & Rowe, 1976; Rowe, 1974; Rowe & Rose, 1977).

Thus, although deep processing appears to result in consistently greater sensitivity to frequency and in more accurate frequency judgments relative to shallow processing, this heightened sensitivity may actually lead at times to biases toward overestimation of frequency (Rowe & Rose, 1977).

Other studies not directly related to the levels of processing paradigm but interpretable within it have also found that greater meaningfulness of stimuli may lead to biases in frequency estimates. Richards (1986) found that both normal controls and recovering alcoholics overestimated the number of positive moods and underestimated the number of negative moods they had experienced over a 2-week period, but that control subjects' overestimation of positive mood frequency was significantly higher than that of recovering alcoholics. Richards reasoned that positive moods may be more salient to relatively normal persons than to recovering alcoholics; furthermore, the alcoholics might be more depressed than nonalcoholics, and less likely to engage in the "cognitive illusions"

(Alloy & Abramson, 1979) engaged in by nondepressed persons which then lead to overestimation of positive life outcomes and circumstances.

Tversky and Kahnemann (1973) reported one of the earliest and most influential studies on biases in judgments of objective frequency. Subjects were presented with two lists, a shorter one with names of famous males and a longer one with names of less famous females (or another set with famous females and less famous males), and were asked to judge the relative presentation frequency of each gender. Subjects incorrectly chose the list with the famous names. In terms of processing levels, famous names are more meaningful to persons than are less famous names, have a greater number of associations to past experiences, and thus are recalled more easily. The greater ease of recall then biases frequency judgments (Tversky & Kahnemann, 1973).

Thus, deeper processing leads to more accurate frequency judgments relative to shallower processing, but can also result in biases that reduce accuracy. In any case, the literature demonstrates that level of processing affects memory for frequency of occurrence, thus casting doubt on the assertion that frequency memory is automatic and not open to influence (Begg et al., 1986; Greene, 1984, 1986; Jonides & Naveh-Benjamin, 1987).

Before continuing with a discussion of the relationship between levels of processing and frequency memory, broader issues pertaining to the validity of the theory of levels of processing should be briefly noted. Although there are presently few published critiques of the levels of processing explanation of obtained differences in

frequency memory, the levels of processing theory as a whole has been trenchantly criticized by a number of researchers (e.g., Baddeley, 1978; Nelson, Walling, & McEvoy, 1979). The problems cited with the theory include a lack of independent measurement of processing depth, lack of evidence for a number of the theory's basic assumptions, and reliance upon supplementary assumptions to make the theory tenable (Baddeley, 1978; Nelson et al., 1979).

The details of this debate cannot be addressed within the limits of the present paper. Moreover, this debate is largely irrelevant to the purpose of the present study, which is not to test the validity of the theory of levels of processing, but, rather, to examine the effects of variations in the personal meaningfulness of stimuli on frequency estimation. The findings of the levels of processing approach to the phenomenon of frequency memory are described here mainly to indicate that there is a precedent and beginning rationale for examining the effects of variations in stimulus meaningfulness on frequency estimates. The levels of processing literature also affords well as to offer a preliminary framework for conceptualizing these potential effects. In fact, as will be detailed later, the present study agrees with one of the major criticisms leveled against the levels of processing literature by Baddeley (1978), namely, that this literature has generally failed to examine levels of processing depth (or of the meaningfulness of stimuli) within the broad categories of structural, phonemic, and semantic encoding.

Several theoretical accounts of the influence of processing level on memory for frequency of occurrence have been offered. Some

researchers hold that deeper processing leads to greater amounts of attention to stimuli and thus to more thorough encoding (Jonides & Naveh-Benjamin, 1987; Maki & Ostby, 1986). Others build upon the "multiple trace" approach of Hintzman and colleagues (Hintzman, 1976; Hintzman & Block, 1971) and hold that deeper processing leads persons to more elaborated and distinctive memory traces (e.g., by providing a greater number of associations for target stimuli upon recall), which can then better serve as the basis of frequency judgments than can traces formed from shallower levels of processing (Begg et al., 1986; Greene, 1986; Jonides & Naveh-Benjamin, 1987; Naveh-Benjamin & Jonides, 1986; Rose & Rowe, 1976; Rowe, 1974; Rowe & Rose, 1977).

Although these explanations account for the finding that more accurate frequency estimates result from deep processing, they do not account for findings of systematic biases (Richards, 1986; Rose & Rowe, 1976; Rowe & Rose, 1977; Tversky & Kahnemann, 1973). Rowe and Rose (1977) and Richards (1986) both cited Tversky and Kahnemann's (1973) notion of the availability heuristic to explain biases in frequency judgments. Tversky and Kahnemann (1973) argued that persons determine averages or ranges of relative frequencies based on the relative ease with which they recall the various stimuli, and then infer frequency from these averages. According to Tversky and Kahnemann (1973), ease of recall is determined by the strength and number of associations to stimuli; strength and number of associations are in turn largely determined by the extensiveness of past experience with the stimulus, although other factors may influence availability and so lead to systematic biases.

Although the notion of trace strength has been seriously questioned by a number of authors (e.g., Hintzman, 1976), the notion of the impact of the number of associations to target stimuli has been viewed as a useful aspect of the Tversky and Kahnemann (1973) position on the relation between availability and frequency estimates of stimuli processed at shallow or deep levels (Rowe & Rose, 1977).

The attentional, multiple-trace, and availability explanations of depth of processing effects are not seen as mutually exclusive. Several researchers advocate approaches that combine two or more of these explanations. For instance, Jonides and Naveh-Benjamin (1987) noted the overlap between the attentional explanation and that based on multiple-trace theory. Rowe and Rose (Rose & Rowe, 1976; Rowe & Rose, 1977) proposed a two-step process of frequency estimation, in which persons first assess general averages on the basis of availability and then move to a more detailed examination of the number of separate traces in memory.

Hasher and Zacks (1984) argued that the effects of orienting tasks which supposedly engender differential levels of processing result from the use of instructions and materials that lead to more covert rehearsals than do the instructions and materials utilized in conditions intended to invoke shallow processing. These covert rehearsals are then difficult to distinguish from actual presentations (Johnson & Raye, 1981) and inflate frequency estimates. However, several researchers (Naveh-Benjamin & Jonides, 1986; Maki & Ostby (1987) presented data that indicate that covert rehearsals do not

account for the increased accuracy of frequency judgments subsequent to deep processing.

Thus, contrary to the assertions of Hasher and colleagues, it appears that a number of factors may substantially influence estimates of the frequency of occurrence of remembered events. In general, these findings seem to indicate that the more meaningfully a person experiences and processes a set of stimuli, the more sensitive he or she is to the frequency of these stimuli. In many cases, increased sensitivity also results in greater relative accuracy. However, other findings show that more meaningful processing may lead to distortions in the absolute accuracy of frequency judgments in the direction of overestimation. Meaningful experiencing and processing can include knowing that it is important to attend to and recall frequency (Greene, 1984, 1986), or can be engendered by the features of the stimuli as they present themselves (Begg et al., 1986; Maki & Ostby, 1987), as they emerge through attention to particular stimulus aspects (Begg et al., 1986; Fisk & Schneider, 1984; Greene, 1984; Maki & Ostby, 1987; Rose, 1980; Rose & Rowe, 1976; Rowe, 1974; Rowe & Rose, 1977), and through cognitive acts that increase their degree of presentness or connectedness with episodic and semantic memory (Begg et al., 1986; Greene, 1986; Jonides & Naveh-Benjamin, 1987; Naveh-Benjamin & Jonides, 1986).

A number of authors have concluded from these findings and others that the processes involved in memory for frequency are not automatic (Begg et al., 1986; Fisk, 1986; Fisk & Schneider, 1984; Greene, 1984, 1986; Maki & Ostby, 1987). However, others have noted that, although

certain factors may improve or inhibit frequency memory, subjects asked to recall frequency under fairly challenging conditions still do so with remarkable precision (Jonides & Naveh-Benjamin, 1987).

Jonides and Naveh-Benjamin (1987) proposed that the most accurate, though perhaps not the most parsimonious account of frequency memory is that it involves direct, automatic encoding as well as indirect, inferential modes of estimation. On the other hand, Begg et al. (1986) have argued and demonstrated that frequency estimates and recognition tasks utilize the same "cognitive stuff"--namely, memory traces that vary in their distinctiveness--and that frequency encoding is thus no more or less automatic than encoding of other memorial information. They and others (Greene, 1986) noted that persons effortlessly encode and process a wide variety of stimulus attributes, and hold that there is no basis for distinguishing memory for frequency from other sorts of memory.

Although the issue of the automaticity of frequency memory remains unsettled, the present evidence shows that variations in the perceived and experienced meaningfulness of stimuli can affect memory for frequency of occurrence.

Meaningful Questions About Memory for Meaningful Stimuli: A Critique of the Current Literature and Directions for Further Research

Although the studies discussed above have asked and provided answers to the question of the relationship between the degree to which persons engage in meaningful processing of stimuli and memory for the frequency of these stimuli, these studies have not posed the

question in the most meaningful fashion. Studies have generally compared relatively meaningful (semantic) with relatively unmeaningful (structural) processing; as Baddeley (1978) noted, few studies have compared the effects of different levels of meaningful processing on frequency memory--that is, the effect of differences in depth of processing within the range of semantic processing. Ecologically speaking, the most interesting issues revolve around identifying the sorts of variations in apprehension of meaningful stimuli that result in systematic variations and biases in frequency memory, rather than comparing the relative effects of meaningful processing with unmeaningful modes of processing rarely initiated outside the laboratory setting. Craik and Lockhart (1972) argued that persons are "normally concerned only with the extraction of meaning from the stimuli" (p. 675); if this is so, then the accuracy-reducing effects of shallow, structural processing tasks may essentially result from inhibition of or interference with the person's characteristic attention to stimuli's semantic aspects (Rose & Rowe, 1976; Rowe, 1974). Thus, a more realistic test of the effect of levels of processing on frequency memory would involve varying the depth of meaningful, semantic processing.

Consideration of the ecologically relevant conditions and situations within which frequency judgments are made brings to the fore the issue of identifying factors that may lead to biases in frequency judgments (Tversky & Kahnemann, 1973). In particular, persons are often faced with the task of making judgments about the relative frequency of two classes of events: the number of single

versus married persons in a community, the number of work or social opportunities of different sorts in prospective places of residence, or the number of times a prospective friend or a long-time associate has behaved in desirable versus undesirable ways. As Tversky and Kahnemann (1973) suggested, research is needed that explores the manner in which persons make these important real-life judgments and that identifies factors that lead to systematic judgment biases.

The most obvious methodological approach to exploring the effects of relative levels of meaningful, semantic apprehension on frequency memory would be to vary the relative levels of meaningfulness of stimuli. If, as Rowe (1974) suggested, the semantic properties of a word--its affective, imagistic, and verbal associative features--form the word's "core of representation" in long-term memory, and if semantic processing leads to higher estimates of frequency, then variations in stimuli that represent different levels of these core attributes might be expected to alter frequency estimates. Stated in another way, if semantic processing leads to more distinctive, elaborated memory traces than does nonsemantic processing (Begg et al., 1986), and if semantic processing leads to higher frequency estimates, then the processing of stimuli that vary on dimensions directly affecting trace distinctiveness and elaboration should result in variations in frequency judgments.

Once again, the current literature, for the most part, does not address the possible effect of variations in semantic qualities on memory for frequency. As was noted earlier, most studies to date have manipulated orienting tasks; few have examined the differences in

frequency memory that result from processing stimuli that vary in meaningful ways. The two studies that did examine the effect of content differences within semantic processing indicate that such differences should be explored. Maki and Ostby (1987) found frequency estimates higher for high familiarity words than for low familiarity words. Begg et al. (1986) found frequency estimates higher and more accurate for unpleasant than for pleasant words, and higher and more accurate for words high in imaginability than for words low in imaginability.

Although the most obvious first step in identifying the effects of variations in semantic properties on frequency memory might be to observe differences for persons in general in their memory for stimuli that vary on relevant "core" semantic dimensions, this approach might also have limited relevance to memory processes as they occur in everyday life. Ultimately, exploration of the effects on frequency memory of variations in the degree of memorial elaboration of semantically processed stimuli must examine chronic differences between persons in what they perceive to be more or less meaningful, more or less salient, and more or less important. Although persons in general certainly may have more elaborated representational or associative networks for certain words as opposed to others (e.g., "mother" versus "outlet"), which in turn might lead to differences in frequency recall (Begg et al., 1986; Jonides & Naveh-Benjamin, 1987), the most widespread differences in the meaningfulness of words and their referents are likely to be found between persons who differ in their experiences with the words and referents. In other words, in

order to explore meaningfully the effects of variations in semantic core properties on frequency memory, research is needed to examine the relation between the perceiver--who brings his or her past history to bear on present perceptual and memorial tasks--and his or her object of perception; for it is in this relation that words and their referents come to be differentially elaborated in memory and to vary in meaningfulness. Begg et al. (1986) hold that "estimates of frequency are sensitive to what was studied and how it was studied" (p. 505); the present argument would add that frequency estimates may also be influenced by the psychological characteristics or concerns of the individual who studies the material at hand, for the "who" factor may affect how material is processed and elaborated in memory.

One manner in which words and referents may vary in meaningfulness between persons is in their relative importance to those persons. In particular, persons might be expected to differ in regards to the importance they ascribe to various behaviors or domains of behavior--domains such as responsibility, independence, obedience, and forgivingness, and their respective opposites. As was discussed earlier, a domain's importance to a person can be construed as the degree to which imagined or perceived behavior in the domain elicits affectively charged evaluations; thus, persons can be expected to vary between them in the extremity of their evaluations of behavior in a particular domain. As a result of differences in the personal importance of various domains, the words representing these domains might provoke different degrees of enrichment or elaboration in memory.

Relatively few studies have appeared in the cognitive and social cognitive literatures that deal directly with the memorial ramifications of differences in the personal value or importance of words and their referents. To recapitulate from earlier portions of this essay, the findings reported in the literatures on the effects of chronic accessibility and self-reference demonstrate that differences in the personal meaningfulness of words and constructs affect recall, with information related to accessible constructs and the self being better recalled than information related to inaccessible constructs, or unrelated to the self (Higgins & Bargh, 1987; Higgins, King, & Mavin, 1982; Rogers, Kuiper, & Kirker, 1977). It has been argued here that, to the extent that chronically accessible constructs and self-reference overlap with the notion of personal importance of behavior domains, these related literatures indicate that it is worth examining the effects of individual differences in domain importance on memory; to the extent that processes that influence recall are involved in memory for frequency of occurrence, the findings of these literatures indicate that it is worth examining the effects of domain importance on frequency memory.

The Effects of Domain Importance on Memory for Frequency of Occurrence: Some Tentative Predictions

As has been argued above, information relevant to personally important behavior domains is likely to be processed more "deeply" than information regarding relatively unimportant domains of behavior; that is, important information will be more thoroughly enriched and elaborated in memory than will less important information. The deeper

processing of information representing important behavior is expected because important information, by the present definition, represents higher levels of core semantic attributes such as affectivity, number of associations to past events, and imagery potential (Rowe, 1974). Greater elaboration and enrichment during processing may result in greater availability of important than unimportant information, leading to a bias in favor of important information. This bias may be emphasized further by any degree of difficulty that the person has in distinguishing external from internal sources of memorial representations (Johnson & Raye, 1981). Thus, personally important information may be judged as more frequent in occurrence than unimportant information, even when the objective frequencies of the important and unimportant stimuli are identical.

In addition to the question of the influence of individual differences in domain importance on memory for frequency of occurrence, there is the question of the possible effects of a behavior descriptor's valence (i.e., positive versus negative) on frequency memory. Persons may differentially recall the frequency of positive versus negative behaviors, even when these occur at fairly equal rates. In addition, valence and domain importance may interact.

Again, as was noted earlier, although the memory literature generally indicates that positive events and stimuli are more readily recalled than negative stimuli (Holmes, 1970; Jersild, 1931; Lishman, 1974; Wagenaar, 1986; White, 1982), a number of studies and reviews conclude that negative stimuli are more recallable than positive stimuli (Baddeley, 1983; Hanawalt & Gebhardt, 1965; Kreidler &

Kreitler, 1968). Few studies to date have directly examined memory for frequency of occurrence of emotionally positive versus emotionally negative stimuli. One study, which did compare frequency memory for normatively pleasant and unpleasant words, found frequency estimates higher for unpleasant than for pleasant words, and also found better recognition memory for unpleasant than pleasant words (Begg et al., 1986). Furthermore, there is evidence from the literature on attention and perception mentioned earlier that negative behavior attracts more attention than does positive behavior (Fiske, 1980; Woll & Martinez, 1982). Thus, negatively toned events may receive higher frequency estimates than positively toned events. Recall, however, that Richards (1986) found both normal controls and recovering alcoholics to underestimate the actual frequency of their negative moods.

Thus, the current literature does not present a clear picture of the effect of affect valence on frequency memory. The literature does, however, indicate that to the extent that frequency memory is affected by the amount of attention directed to a stimulus (Jonides & Naveh-Benjamin, 1987; Maki & Ostby, 1987), and to the degree to which the valence of a stimulus affects deployment of attention (Fiske, 1980), the valence of a behavior descriptor may affect memory of its frequency.

Overview of the Present Study

The present study seeks to determine whether individual differences in the personal significance or importance of various

behavior domains lead to biases in the recall of words that represent these behavior domains. Domains of high and low importance were identified for each subject through the use of the Feelings About Behavior instrument utilized in the previously described study on autobiographical memory. To recount, the instrument asked subjects to make evaluative ratings and rankings of a varied set of behavior domains. The evaluations centered on the degree of positive and negative affect the subject imagined he or she would experience if he or she were to behave in the manner represented by the domain descriptor. Thus, in the context of the present study, the operationalization and assessment of "importance" involved an indeterminate mixture of affective potency, imaginability, self-relevance, and evaluative significance.

In the actual experiment, subjects were presented with word lists in which were embedded equal presentations of the preselected high positive, high negative, low positive, and low negative domain words. The memory test asked subjects to discriminate which of two words they recalled seeing more frequently. Subjects made these discriminations for each of the six possible combinations of the four conditions.

Subjects were also asked to rank the four domain words in terms of the degree to which they thought about, used, and encountered the words or their referent behaviors in various social judgments and settings. This ranking measure was included to explore the notion that increased availability and deeper levels of processing of stimuli are dependent at least in part on the frequency of a person's experience with these stimuli in real life.

Method

Subjects

The 68 subjects who participated in the memory for frequency of occurrence study were drawn from a subject pool of 310 middle- to upper-middle class freshmen and sophomores enrolled in an introductory psychology course during the Fall of 1986. Of the 68 subjects, 35 were male and 33 were female.

Domain Assessment and Subject Selection

To assess high and low importance domains of behavior, the present study utilized the Feelings About Behavior questionnaire and the same criteria for high and low importance as those employed in the previously described study on autobiographical memory. These procedures will not be redescribed here.

In the present study, five domains were employed--those domains represented by the value terms broadminded, cheerful, courageous, forgiving, and independent. As in the autobiographical memory study, an attempt was made to represent each of the 20 possible two-domain combinations in the two importance combinations. An attempt was also made to place equal numbers of males and females in each combination.

Selection and Arrangement of Experimental Stimuli: Word Lists

Each subject was presented with a list of 90 words. The list was composed of 20 different words. Four of these were adjectives that represented the value domains in the four experimental conditions derived from the 2 x 2 design: High and low importance x positive

and negative valence. These "key words" were each presented four times in the total array of 90 word slots. The remaining 16 words were fillers. The filler words selected describe physical and temporal features of objects and events. Filler words accounted for 74 of the 90 word slots.

The general strategy for selection of filler words was to find words that would resemble the key words enough to mask the exact nature of the experiment, but that would not be more salient than the key words. Thus, filler words were selected on the basis of the following criteria:

1. They were adjectives.
2. They did not describe human behavior or personal traits.
3. They seemed unlikely to evoke specific concrete images or to arouse strong emotion.

Imagery potential and emotionality are both properties found to contribute greatly to the relative salience of a stimulus word (Rubin & Friendly, 1986). At present, imagery and emotionality norms have been established for relatively few adjectives (Rubin & Friendly, 1986); thus, filler words could not be matched either with themselves or with key words on the basis of established norms. However, the filler words selected all had face valid low imagery and emotionality.

Two other factors known to affect word stimulus salience are the length of the word (number of letters) and "K-F frequency"-- the frequency with which the word appears on average in the English language, based on norms developed by Kucera and Francis (1967). Key words ranged in length from 8 to 12 letters, with a mean of 10.30;

filler words ranged in length from 6 to 13 letters, with a mean of 9.40. Match on K-F frequency was less accurate, because several of the key words were not listed in Kucera and Francis's (1967) tabled norms. However, extrapolating from the key words for which there are established K-F frequencies, the mean K-F frequency for key words was 20.33, with a range of 1-67; the mean for filler words was 15.70, with a range of 1-63.

Construction of Word List

As noted above, the 4 experimental key words in a particular subject's word list were presented 4 times each in the list. Filler words were presented from 3 to 6 times in the list, according to the following schedule:

5 words @ 3 times each

1 word @ 4 times each

5 words @ 5 times each

6 words @ 6 times each

This schedule resulted in filler words being presented an average of 4 times each.

All subjects received the same set of filler words in the same order. Filler words were randomly ordered and randomly assigned to slots in the list. The one constraint in word placement was that no word was repeated within four slots.

Specific experimental key words varied for each subject; thus, slots, rather than specific words, were assigned to experimental conditions. The placement of these slots was identical for all

subjects. Experimental conditions were assigned to slots with the following constraints:

1. The first and last presentations of a key word were placed several slots away from the beginning and end of the list, respectively, to minimize primacy and recency effects.
2. Slots for experimental conditions were never less than four spaces apart, or more than seven spaces apart from each other.
3. All four experimental conditions were represented with equal frequency across the list, once in each of the four quadrants of the list (i.e., once in every set of 22 to 23 slots).

The experimental conditions were arranged in three random orders. Roughly equal numbers of subjects from each domain combination were randomly assigned to each of the three random orders of condition presentation.

Presentation of Stimuli

The word lists were presented visually, via slide projector. Each word was presented for 4 seconds. There was a 1-second delay between word exposures.

Dependent Variable: Memory for Frequency of Occurrence

The memory test required subjects to recall which of two words in a pair they saw most frequently in the stimulus presentation. Six word pairs were listed on the response sheet (see Memory Experiment: Answer Sheet, Appendix A); these six pairs represented each possible combination of the four experimental conditions. Two random orders of these condition pairs were created for each domain x valence

combination, so as to vary the presentation order of word pairs in the test sequence.

A second set of materials (entitled "Rankings," see Appendix A) was included to explore the possible relations between the frequency with which persons use or encounter particular value domains in various social contexts, and memory for frequency of occurrence of words representing these domains. Subjects were asked to rank order the four key words in terms of how frequently they used or encountered them in the following five real-life social contexts, settings or activities:

1. How frequently you think about each of these words and/or the behaviors they refer to in an average week (7-day period).
2. How frequently you have used these words to describe yourself or your behavior since you arrived at Duke this semester.
3. How frequently you have used these words to describe your friends and acquaintances since you arrived at Duke this semester. Acquaintances can include both people you like and people you dislike.
4. How frequently your mother has used these words to describe you and your behavior.
5. How frequently your father has used these words to describe you and your behavior.

Procedure

Subjects were tested individually. They were read the following instructions:

Today you will participate in a study on memory. Using slides, I will show you a set of words, one at a time, on this screen. Later I will test your memory. I will now turn off the lights, and will show you the words. Please keep your eyes on the screen so that you don't miss any of the words.

Lights were then turned off, and the stimuli were presented. Stimuli presentation took approximately 8 minutes. Subjects were then given the primary memory test sheet, and were instructed in how to complete the test.

After completing this test, subjects were given the ranking inventory. Following completion of these materials, subjects were thanked for their participation and given class credit. The total time required for each subject to complete the experiment was 20 to 25 minutes.

After all subjects had been seen, the experimenter met with them, described the nature of the experiment, and answered subjects' questions.

Results

All 68 subjects completed the entire experiment. One subject was unable to complete one of the ranking questions (Frequency of Description by Father) because she had not been raised with a father or father-substitute. Aside from this one case, all subjects completed all measures.

The results will be described in two parts: The findings for memory of frequency of domain words, and the findings for estimates of frequency of using or encountering the words in real-life contexts.

Memory of Frequency of Domain Words

Effects of Importance

There were three steps in the analysis of differential memory of the frequency of high and low importance domain words. First, for each of the four word pairs that contrasted high and low importance, tallys were done of the number of times subjects recalled the high importance word as more frequent than the low importance word, and vice-versa. Second, chi-square tests were computed to compare the frequencies of high importance endorsements with low importance endorsements within each pair of conditions. Finally, t tests were conducted on the overall frequency endorsements of high versus low importance words. The chi-square tests and t tests were conducted for the subject sample as a whole, as well as for males and females separately. In addition, these tests were conducted for the two pairs of conditions that represented "pure" or unconfounded comparisons of memory of frequency of positive words with memory of frequency of negative words.

Table 10a presents the tallys and percentages of frequency endorsements for high and low importance words, along with the chi-square tests, for the four pairs of conditions comparing memory of high and low importance domain words for the sample as a whole. For three of the four pairs, significant chi squares indicate that high importance words were recalled as being more frequently presented than the low importance words. For the fourth pair of conditions--high importance negative versus low importance negative words--the chi-

square was marginally significant ($p < .07$) and in the same direction as the significant comparisons. The t test comparing overall endorsements of high versus low importance words was highly significant, with the mean number of endorsements of high importance domain words = 2.63 and mean number of endorsements of low importance words = 1.37, $t = 4.50$, $p < .0001$.

Thus, the data indicate that subjects' recall of the frequency of high versus low importance words was biased in the direction of high importance words: Subjects reported that they saw words representing high importance domains significantly more frequently than they saw words representing low importance domains, despite the fact that high and low importance words appeared with equal frequency during the stimulus presentation.

Essentially the same findings held when comparisons were conducted for males and females separately, although fewer of the chi squares were significant, especially for males. Tables 10b and 10c present the results for males and females separately. For males, only one of the chi squares achieved significance--high importance positive words were found to be estimated as significantly more frequent than low positive words. The tallys were in the same direction for the remaining three pairs, but the differences did not achieve significance. The overall t test was highly significant, with the mean number of endorsements of high importance words = 2.54 and the mean number of endorsements of low importance words = 1.46, $t = 3.17$, $p < .0001$.

Table 10a

Frequencies, Percentages, and Chi Squares for High Versus Low Importance
Frequency Endorsements for Males and Females Combined

Condition Pair	Frequency High	% High	Frequency Low	% Low	X	p
HP vs. LP	45	66	23	34	7.12	< .01
HP vs. IN	50	74	18	26	15.88	< .001
HN vs. LP	43	63	25	37	4.76	< .05
HN vs. IN	41	60	27	40	2.88	< .07
Overall	179	66	93	34		

Table 10b

Frequencies, Percentages, and Chi Squares for High Versus Low Importance
Frequency Endorsements for Males Only

Condition Pair	Frequency High	% High	Frequency Low	% Low	X	p
HP vs. LP	22	63	13	37	2.32	< .25
HP vs. IN	26	74	9	26	8.26	< .001
HN vs. LP	22	63	13	37	2.32	< .25
HN vs. IN	19	54	16	46	.26	< .75
Overall	89	64	51	36		

Table 10c

Frequencies, Percentages, and Chi Squares for High Versus Low Importance
Frequency Endorsements for Females Only

Condition Pair	Frequency High	% High	Frequency Low	% Low	X	p
HP vs. LP	23	70	10	30	5.12	< .025
HP vs. IN	24	73	9	27	6.82	< .01
HN vs. LP	21	64	12	36	2.46	< .25
HN vs. IN	22	67	11	33	3.66	< .10
Overall	90	68	42	32		

For females, two of the four chi squares achieved significance: the test comparing high positive to low positive words, and the test comparing high positive to low negative words. In both cases, the high importance words were remembered as being more frequent than the low importance words. The tallys were in the same direction for the remaining two pairs, though not significantly different. Again, the overall t test was highly significant, with the mean number of endorsements of high importance words = 2.73 and the mean number of low importance endorsements = 1.27, $t = 3.23$, $p < .0001$.

Thus, although males and females both generally recalled high importance words as being more frequent than low importance words, there were some differences between them. First, the effect appears to be somewhat stronger for females than for males, given that females' differential recall was significant for two of the four word pairs whereas males' differential recall was significant for only one of the word pairs. In addition, although females' differential recall of high negative words versus low negative words approached significance (67% versus 33%, $p < .10$), the difference between tallys for males was not even close to significant (54% versus 46%, $p < .75$).

In light of these suggestions of a trend of gender differences in frequency memory for high and low domain words, chi squares for each of the condition pairs (i.e., high positive versus low positive) were computed between gender in order to test whether or not the frequency effect was more evident for one than for the other. None of the comparisons were significant; in fact, the highest chi-square obtained was 1.09, $p < .90$.

Thus, although the data suggest that females may be slightly more affected by domain importance in their frequency memory than are males, this gender difference is by no means statistically significant.

Effects of Valence

In addition to examining the differential frequency recall of high and low importance words, differential recall of positive and negative words was assessed. Table 11a presents for the subject sample as a whole the tallys, percentages, and chi-square tests for each of the four word pairs that contrasted positive with negative words; Tables 11b and 11c present the same information separately for males and females.

For the subjects as a group, two of the four chi-square tests were significant: the comparison of high importance positive to low importance negative words, and the comparison of high importance negative to low importance positive words. However, these effects were in opposite directions in regards to valence: High positive words were recalled as more frequent than low negative words, whereas high negative words were recalled as more frequent than low positive words. Note that both of these effects were also described above in reference to high importance-low importance differences, where they provided consistent evidence for the bias of high importance over low importance. Neither of the two "pure valence" comparisons--high positive versus high negative, and low positive versus low negative--resulted in significant chi squares, although the tallys and

Table 11a

Frequencies, Percentages, and Chi Squares for Positive Versus Negative Frequency Endorsements for Males and Females Combined

Condition Pair	Frequency Positive	% Positive	Frequency Negative	% Negative	X	p
HP vs. HN	39	57	29	43	1.48	< .25
LP vs. LN	38	56	30	44	.94	< .50
HP vs. LN	50	74	18	26	15.88	< .001
LP vs. HN	25	37	43	63	4.76	< .05
Overall	152	56	120	44		

Table 11b

Frequencies, Percentages, and Chi Squares for Positive Versus Negative Frequency Endorsements for Males Only

Condition Pair	Frequency Positive	% Positive	Frequency Negative	% Negative	X	p
HP vs. HN	18	51	17	49	.02	----
LP vs. LN	17	49	18	51	.02	----
HP vs. LN	26	74	9	26	8.26	< .001
LP vs. HN	13	37	22	63	2.32	< .25
Overall	74	53	66	47		

Table 11c

Frequencies, Percentages, and Chi Squares for Positive Versus Negative Frequency Endorsements for Females Only

Condition Pair	Frequency Positive	% Positive	Frequency Negative	% Negative	X	p
HP vs. HN	21	64	12	36	2.46	< .25
LP vs. LN	21	64	12	36	2.46	< .25
HP vs. LN	24	73	9	27	6.82	< .01
LP vs. HN	12	36	21	64	2.46	< .25
Overall	78	59	54	41		

percentages were in the direction of positive over negative. In addition, the t test of positive versus negative was not significant, with the mean for number of endorsements of positive words = 2.24 and the mean for number of endorsements of negative words = 1.76, $t = 1.47$, $p < .20$. Thus, although there was an overall nonsignificant tendency to recall positive behavior descriptors as being more frequent than negative behavior descriptors, for the subjects as a whole valence did not appear to influence memory significantly for the frequency of behavior descriptors.

The results for the subject sample as a whole were essentially the same for males and females examined separately. For both males and females, the only significant chi square emerged for the comparison of high importance positive and low importance negative, with high importance words being recalled as more frequently presented than low importance negative words. (Again, these results were described above in reference to memory for high versus low importance events.) Neither of the "pure valence" comparisons yielded significant chi squares. The tallies and percentages of positive versus negative choices suggest that females tended to recall positive behavior words as being more frequently presented than negative behavior words, although this difference was not significant. Males, on the other hand, recalled the frequency of positive and negative behavior words as being roughly equal. Neither of the t tests by gender was significant. For males, the mean number of endorsements of positive words = 2.11 and the mean number of endorsements of negative words = 1.89, $t = .52$, $p < .80$; for females, the mean number of

endorsements of positive words = 2.36 and the mean number of endorsements of negative words = 1.64, $t = 1.63$, $p < .20$. The differences in the t tests again suggest that females demonstrated a nonsignificant tendency to be influenced in their frequency recall by valence. However, as in the case of direct chi square comparisons of gender for importance as described above, none of the chi square tests directly comparing gender for valence effects were close to significant.

Summary of Frequency Memory Findings

The findings for subjects' memory of the frequency of behavior descriptors presented in a controlled experimental setting suggest that domain importance influences frequency memory whereas valence does not. More specifically, the relative personal importance of various domains of behavior appears to bias recall of the relative frequency of words that describe these domains, such that words denoting high importance domains are recalled as appearing more frequently than words denoting low importance domains, despite objectively equal presentation of these words. This effect obtains for both males and females. Although females show a slight tendency to be more influenced by importance and by valence in their recall than are males, this gender difference is not significant. Finally, although there is a trend for words denoting positive behaviors to be recalled as more frequent than words denoting negative behaviors, this effect too is not significant.

Frequency Estimates of Real-Life Occurrence of Behavior Descriptors

Significant findings emerged for all five of the questions that assessed subjects' estimates of the frequency with which they have encountered words that represent high and low importance domains. The findings for each question will be described in turn. Means and tests of significance for main effects, as well as tests of significance for interactions, are reported in the text; matrices of means for significant interactions and levels of significance for the pairwise comparisons, are presented in Tables 12a through 12d. Analysis of variance tables from which significant effects are drawn are presented in Tables 33 through 37 (Appendix B). The Bonferonni test was used in all pairwise comparisons of means.

Question 1: Frequency of Thinking About Domain Words and/or Referent Behaviors in Average Week

Significant main effects emerged for both importance and valence. The direction of the means for the importance main effect suggests that subjects estimated that they think about high importance words and behaviors significantly more frequently in an average week than they think about low importance words and behaviors, with the mean for high importance = 2.25 and the mean for low importance = 2.75, $F(1, 66) = 8.65, p < .005$. The direction of the means for the valence main effect suggests that subjects estimated that they think about positive behavior words and positive behaviors significantly more frequently than negative words and behaviors, with the mean for

Table 12a

Importance x Valence Interaction for Frequency of Weekly Encounter with Domain Words

	P	N
H	1.69	2.80***
<hr/>		
L	2.46	3.03***

Table 12b

Importance x Gender Interaction for Frequency of Use of Domain Words in Self-Description

	M	F
H	2.65	2.35
<hr/>		
L	2.36	2.68

Table 12c

Importance x Valence Interaction for Frequency of Description by Mother in Terms of Domain Words

	P	N
H	1.75	3.41***
<hr/>		
L	2.12	2.72***

Table 12d

Importance x Valence Interaction for Frequency of Description by Father in Terms of Domain Words

	P	N
H	1.52	3.40***
<hr/>		
L	2.22	2.85***
	***	***

*p < .05. **p < .01. ***p < .001.

Note 1. Stars to the right of the two means indicate a significant difference between those two means; stars below two means indicate a significant difference between those two means.

Note 2. Scores are based on rankings. Smaller values equal higher scores.

positive = 2.08 and the mean for negative = 2.92, $F(1, 66) = 39.68$, $p < .0001$.

There was also a significant interaction of Importance x Valence, $F(1, 66) = 6.10$, $p < .02$. The interaction was ordinal in respect to both valence and importance. However, although the valence effects remained significantly different in both importance conditions, the reverse was not true: Although high importance positive words and behaviors were reported to be thought about significantly more often in an average week than low importance positive words, high importance negative words and behaviors were not reported to be thought about significantly more frequently than low importance negative words.

Question 2: Frequency of Use of Domain Words in Self-Description

There was a main effect for valence, with positive behavior descriptors reported as being used more frequently than negative behavior descriptors in self-description: the mean for positive words = 2.05 and the mean for negative words = 2.97, $F(1, 66) = 46.99$, $p < .0001$.

A significant interaction of Importance x Gender also emerged, $F(1, 66) = 4.45$, $p < .04$. Pairwise tests of the means suggest that males recalled that they have used low importance domain words to describe themselves significantly more often than they have used high importance domain words, whereas females recalled that they have used high importance domain words significantly more often than low importance domain words in self-description. In addition, females were found to recall using high importance domains words as self-

descriptors significantly more often than did males, whereas males' recall estimates of using low importance words as self-descriptor words were significantly higher than were females' recall estimates of using low importance words. In other words, females recalled describing themselves more frequently in terms of words denoting important behavior domains than in terms of words denoting behavior that is relatively unimportant to them, whereas males recalled describing themselves more often in terms of low importance behaviors than in terms of high importance behaviors; and males' recall estimates of frequency suggest that they describe themselves in terms of relatively unimportant behaviors more often than do females, whereas females' frequency estimates suggest that they describe themselves in terms of important behaviors more often than do males.

Question 3: Frequency of Use of Domain Words in Descriptions of Friends and Acquaintances

The sole finding for this question was a valence main effect, with the mean for positive behavior descriptors = 2.24 and the mean for negative behavior descriptors = 2.76, $F(1, 66) = 9.87$, $p < .003$. The direction of the means suggests that subjects recalled describing others more frequently in terms of positive behaviors than in terms of negative behaviors.

Question 4: Frequency with Which Mother Described You in Terms of Domain Words

A highly significant valence main effect emerged, with the mean for positive words = 1.94 and the mean for negative words = 3.07, $F(1, 66) = 77.85$, $p < .0001$. The direction of the means suggests that

subjects recalled their mothers describing them in terms of positive behavior significantly more often than in terms of negative behavior.

There was also a significant Importance x Valence interaction, $F(1, 66) = 14.08, p < .0004$. Although the interaction was ordinal with respect to valence, examination of the means and the levels of significance suggests that there was a greater difference between frequency estimates of mothers' use of positive and negative behavior descriptors in the case of high importance domains than in the case of low importance domains. In other words, although subjects recalled that their mothers generally described them in terms of positive behaviors more often than in terms of negative behaviors, subjects recalled a larger difference in the frequency with which their mothers described them in terms of positive versus negative descriptors when it came to domains of high importance to the subjects themselves than when it came to domains of relatively little importance.

Although this finding is interesting, the significant interaction appears to be due more to differences in subjects' frequency recall of how often their mothers described them in terms of high and low importance behaviors in the case of positive behaviors versus in the case of negative behaviors. Pairwise tests of the means suggest that subjects recalled their mothers describing them significantly less often in terms of high importance negative behaviors than in terms of low importance negative behaviors, whereas they recalled their mothers describing them more often in terms of high importance positive behaviors than in terms of low importance positive behaviors, although this latter difference was only marginally significant.

Question 5: Frequency with Which Father
Described You in Terms of Domain Words

The effects that emerged for subjects' rankings of the frequency with which their fathers described them in terms of the domain words were essentially the same as those that emerged for rankings of the frequency with which their mothers described them in terms of these words. There was a highly significant main effect for valence, with the mean for positive behavior descriptors = 1.87 and the mean for negative behavior descriptors = 3.13, $F(1, 65) = 99.33$, $p < .0001$. The direction of the means suggests that subjects recalled their fathers describing them significantly more frequently in terms of positive behavior descriptors than in terms of negative behavior descriptors.

There was also a significant interaction of Importance x Valence, $F(1, 65) = 26.71$, $p < .0001$. The interaction was again ordinal with respect to valence, and, again, the valence differences within the high importance condition were much larger than the valence differences within the low importance condition. That is, subjects appeared to recall that the difference between their fathers' use of positive behavior words to describe them and use of negative behavior words to describe them was greater in the case of behaviors of high importance than in the case of low importance, though, in both cases, subjects recalled their fathers as describing them significantly more often in terms of positive behaviors than in terms of negative behaviors.

As in the case of rankings of mothers' descriptions, however, the interaction appears to be due to differences in the direction of means for high and low importance within valence conditions. Subjects recalled their fathers describing them significantly less often in terms of high importance negative behavior descriptors than in terms of low importance negative behavior descriptors, and remembered their fathers describing them significantly more often in terms of high importance positive descriptors than in terms of low importance positive descriptors. It is interesting that subjects recalled a significant difference in the frequency with which fathers described them in terms of high and low importance positive behaviors, while recalling this difference as less clear in the case of mothers' descriptions of them. This difference in the pattern of findings, as well as the other findings described above, will be taken up in the discussion to follow.

Discussion

The results of the controlled experiment on frequency memory confirmed the major prediction of the present study: Subjects were found to estimate that words representing high importance domains occurred more frequently in a list than did words representing low importance domains, even though high and low importance words actually occurred with equal frequency. This finding held for both males and females and was not affected by the valence of the behavior descriptors. Thus, the data demonstrate that in a forced-choice paradigm, persons' frequency estimates will be biased in the direction

of high over low importance behavior descriptors. More broadly, in the language of the prediction made earlier, the present data indicate that individual differences in the personal significance or importance of various behavior domains can lead to biases in the recall of words that represent these behavior domains.

This discussion will first examine the implications of the present findings on frequency estimation for the debate about the automaticity of frequency memory. It will then turn to possible explanations for the present effects. The findings obtained for estimations of the frequency of encounter with behaviors and behavior descriptors in real-life contexts will be integrated into the discussion of the controlled laboratory study on frequency and will also be discussed separately.

Biases and Automaticity

What do the present findings add to the debate about the automaticity of memory for frequency? The present study was not designed to test the automaticity hypothesis; intention to encode frequency was not manipulated, nor were competing tasks introduced, two conditions that many researchers believe together represent the "hallmark" of the concept of automatic processing (see Naveh-Benjamin & Jonides, 1986, for review).

However, to the extent that the automaticity hypothesis suggests that there should not be differences in frequency estimates for stimuli that vary on some qualitative dimension, that there should not be differences between persons in frequency memory, and that there

should not be systematic biases in frequency estimation, the present findings do challenge the notion of frequency memory as automatic.

Those who uphold the notion of frequency memory as automatic could argue that the present study does not establish that there were biases at the encoding stage. It could be argued that several confounding processes occur or potentially occur between presentation of a stimulus and the task of frequency estimation, including covert rehearsal and enhancement of retrieval by certain test stimuli over others.

Several points can be addressed in response to this potential criticism. First, the focus of the present study is not on the effects of domain importance on encoding of frequency, but on the effects of importance on memory for frequency as operationalized by the task of frequency estimation. For both scientific and practical purposes, it is valuable to establish overall that biases in frequency estimation occur that are dependent on individual differences in the personal importance of remembered stimuli; further research can take up the issue of which elements in the memory process contribute most to these biases. Differences in the encoding of high and low importance behavior descriptors may emerge as a major factor in the obtained biases.

Second, it seems possible to question the legitimacy of asserting a clear-cut distinction between encoding and covert rehearsal and to dismiss frequency memory effects that are potentially attributable to covert rehearsal. This clear-cut distinction assumes that encoding is a temporally discrete moment in the memory process, whereas it may be

that a certain degree of covert rehearsal--perhaps only in the seconds during and immediately following exposure to a stimuli--is necessary for encoding beyond the level of attention or short-term memory. Thus, to the extent that the present results are due to increased attention to high versus low importance stimuli, and so to a few more rapid covert rehearsals of high importance stimuli during and immediately after stimulus presentation, the present results could still be viewed as suggesting that high importance stimuli are encoded more fully than low importance stimuli.

Third, as was noted in the preceding literature review, the two studies explicitly designed to test the notion that increased covert rehearsal accounts for the memory-enhancing effects of deep processing found covert rehearsal unrelated to these levels of processing effects (Maki & Ostby, 1987; Naveh-Benjamin & Jonides, 1986). In addition, the previously described study on autobiographical memory did not find a main effect for domain importance on the frequency of rehearsal of personal memories; these memories were of events in the same behavior domains as those represented by the stimulus words in the present frequency study. Thus, direct and indirect evidence strongly suggests that covert rehearsals that occurred well after the encoding period were not responsible for the obtained effects of importance on frequency memory.

Regarding the potential argument that the present results may reflect the enhanced retrieval properties of high importance words over low importance words rather than differences in the encoding of these words, it could be counterargued that if enhancement of

retrieval cues can override the automatic encoding of frequency, then frequency encoding is not a powerful determinant of frequency estimation. In other words, it seems trivial to assert that frequency encoding is automatic and unaffected by differences in the nature of an orienting task or the encoded stimuli if automatic encoding holds little weight in the process of frequency estimation as compared to the relative power of retrieval cues. In addition, it seems likely that the same factors that make one stimulus more retrievable than another may also lead to improved encoding of one stimulus over the other.

In sum, although the present study was not specifically designed to shed light on the automaticity issue per se, the obtained results do add further support for the notion that frequency memory is not unaffected by the properties of the stimulus remembered. To that extent, the present findings add support for an indirect as opposed to direct process of frequency memory and estimation (Begg et al., 1986). Furthermore, the present findings cast doubt on the automaticity claim that persons do not vary among themselves in their frequency memory. By examining the relation between person and stimulus, the present study at once demonstrates that frequency memory can be affected by differences between people and between stimuli.

Although the present findings cast doubt on a conception of automaticity defined as imperviousness to differences in how persons regard and remember particular stimuli, these findings could be viewed as supporting a broader conception of automaticity. That is, to the degree that the present findings represent a systematic effect on

memory and one not mediated by conscious deliberation, intention, or effort, these findings speak to the notion that domain importance may automatically affect memory for frequency. In turn, if it is assumed that differences in the personal importance of behavior domains are a product of differences in socialization experiences, then the present findings suggest that socialization may have an automatic effect on frequency memory.

Theoretical Explanations for Importance Biases in Frequency Memory

The present findings may be tentatively explained by several of the variants of hypotheses offered in the depth of processing literature on frequency memory. As was noted earlier, the present study assumes that variations in the level of personal importance of the behavior domains described by the test stimuli result in these stimuli bearing different levels of the core attributes involved in semantic processing, including affective, imagistic, and verbal associative properties (Rowe, 1974). Greater personal importance would then be associated with higher levels of these core semantic attributes, resulting in enhanced semantic processing and, thus, more distinctive, better elaborated traces (Begg et al., 1986). In a forced-choice paradigm, persons are then more likely to recall high importance words as being more frequent than low importance words, for the memory traces of high importance words have greater distinctiveness. This explanation follows the logic of Begg et al. (1986) and Naveh-Benjamin and Jonides (1986), who argued that deeper semantic processing leads to increased distinctiveness, which in turn

provides more reliable, salient, compelling data for the frequency estimation task.

One interesting question is that of the differential contribution of the component core attributes to biases in frequency estimation of important versus unimportant words. Do the affective properties of these words explain most of the variance? Or are the obtained effects largely due to differences in the imaginability or the verbal associativeness of important versus unimportant words?

In order to explore this question systematically, the present findings will be recast from the perspectives of each these different semantic attributes in turn. The reader is asked to have forbearance with this redundancy.

The Role of Verbal Associations in Frequency Estimation

Naveh-Benjamin and Jonides (1986; Jonides & Naveh-Benjamin, 1987) argued most strongly for the notion that semantic processing leads to a greater number of associations to stimulus words at time of frequency estimation, and that this associative elaboration of the stimulus accounts for higher and more accurate frequency estimates. To follow this line of argument, it might be that high importance words evoke a greater number of associations than do low importance words, and that in a forced-choice paradigm where words are actually presented with equal frequency, the greater number of associations will lead to a bias in favor of high importance words.

The results of the frequency estimates of encounters with high and low importance behaviors and behavior descriptors in real-life

contexts may shed some preliminary light on the validity of this argument. To the extent that the frequency of real-life encounters with behavior descriptors or their referent behaviors increases the potential number of associations to these descriptors in the frequency estimation task, the data generally support the association hypothesis, but only in the case of positive events. Persons were found to estimate a higher frequency of weekly encounter with high importance positive behaviors and behavior descriptors than with low importance positive behaviors and descriptors, but not in the case of negative behaviors and descriptors. Even more strikingly, persons estimated being described by their mothers and fathers significantly more often in terms of high importance positive behavior descriptors than in terms of low importance positive behavior descriptors, but significantly less often in terms of high importance negative behavior descriptors than low importance negative behavior descriptors. To the extent that these data reflect relatively accurate discriminations of frequency, they would lead to a prediction of a bias of high importance positive words over low importance positive words, and a reverse bias in the case of words describing negative behaviors, if the notion of enhanced association has merit.

That high importance prevailed over low importance in all comparisons can be tentatively explained in two ways. First, it may be that for positive behavior descriptors the number of verbal associates is indeed syntonically related to the distinctiveness of a memory trace, whereas for negative behavior descriptors the reverse

may be true: A negative behavior descriptor may become more salient and distinct by its failure to produce numerous associations.

Begg et al. (1986) presented some data relevant to this explanation. The researchers found increases in frequency estimates greatest for relatively unpleasant items and smallest for relatively pleasant items, suggesting that "the unpleasant items are more discriminably different in the present context than are the more pleasant items" (p. 505). It can be argued from these data that, if negative stimuli are generally more distinctive than positive stimuli, greater numbers of associations to negative stimuli might actually lessen these stimuli's distinctiveness. Those negative stimuli with the fewest available associations may be the most salient.

Second, as noted earlier, Fiske (1980) and others (e.g., Woll & Martinez, 1982) have demonstrated that negative events are given greater amounts of attention than are positive events. Concordantly, high importance negative events might be expected to garner more attention than low importance negative events. Thus, although it may be that high importance positive words are recalled as more frequent because they spontaneously access more of a variety of associated events (i.e., more related events that are temporally and spatially distinct from one another), the memories of associated events evoked by high importance negative words may differ from those evoked by low importance negative words in the person's recollection of the amount of attention given to the event at the time of occurrence. That is, persons may recall attending to high importance negative stimuli and associated events longer or more intensely than to low importance

stimuli; this recollection of differential degree of attention may serve to make high importance negative events more distinctive than low importance events.

Clearly, both of the above explanatory ideas would require further inquiry before receiving serious consideration as hypotheses. The following interesting research questions emerge from these ideas:

1. Do persons spontaneously produce more associations to positive events than to negative events, more associations to high importance positive events than to low importance positive events, and fewer associations to high importance negative events than to low importance negative events?

2. Are the fewer associations generated to high importance negative events versus low importance negative events as distinctive as the greater number of associations generated to high importance positive events versus low importance positive events?

3. Do persons fixate or attend more to high importance negative events than to low importance negative events?

4. Is there evidence that part of what a person recalls about an experienced event is the amount of attention given to the event at time of encoding, especially in the case of negative events?

Each of these proposed research questions is interesting in and of itself, but all would be necessary to explore in order to delineate the role of the number and type of associations to target stimuli in the estimation of the frequency of high and low importance behaviors and behavior descriptors.

One constraint on the two preliminary explanations outlined above is that, just as biases were discovered in estimations of frequencies of high and low importance words presented in a controlled setting, the data obtained for estimates of real-life frequencies--which provide the empirical impetus for these explanations--may be biased as well. Subjects may have distorted the relative frequencies of real-life encounters with high and low importance positive and negative behaviors and descriptors. A more definitive study would need to examine the average number of actual encounters persons have with behaviors and behavior descriptors that vary in personal importance and valence.

On the other hand, the number of associations available to behavior descriptors may have less to do with differences in the actual number of related encounters and more to do with the processes that lead to differences in the accessibility of these associations. That is, descriptors of high importance behaviors may serve as more effective retrieval cues than do descriptors of low importance behaviors, and may result in greater accessibility of associations for high importance words than low importance words. The central research question suggested by this idea is that of comparing records of the actual number of encounters had with behaviors and descriptors to the number of accessible associations at the time of a frequency memory test. Apart from the present finding of a bias or distortion in judgments of the actual frequency of high importance versus low importance descriptors, the earlier described lack of a main effect for domain importance on judgments of the retrospective expectedness

and predicted likelihood of autobiographical events suggests that the number of associations spontaneously generated to target stimuli may be more dependent on enhanced versus diminished accessibility rather than actual, objective differences in the number of associated experiences.

The Role of Imagability in Frequency Estimation

The notion that high importance words may have greater imagability than low importance words gains some support from the autobiographical memory literature described earlier, as well as from the findings of the present autobiographical memory study. Recall that Rubin and Kozin (1984) and Fitzgerald (1986) both found personal importance to be the factor most highly associated with memory vividness. Although the present autobiographical memory study did not find a main effect for domain importance on image vividness, domain importance was involved in all of the significant interactions on image vividness. Moreover, the overall effect of domain importance was to enhance the salience of memories of high importance behavioral events. Because words are less complex stimuli than autobiographical memories, it may be that main effects would emerge in a study of the effects of domain importance on imagability of behavior descriptors. Images evoked in rapid imagability judgments of behavior descriptors are likely to be condensations of relevant autobiographical events or symbolic reconstructions of such events and will likely have a paradigmatic quality, as opposed to images of particular autobiographical events. As a result, these paradigmatic images might

be more polarized in image clarity for high versus low importance behavior descriptors than are memories of discrete events. The need for a study examining imagability of high and low importance behavior descriptors is clearly indicated by the present results.

In addition to the indications from autobiographical memory studies, Begg et al. (1986) found higher frequency estimates for high imagability words than for low imagability words. Although Begg et al. utilized nouns rather than behavior descriptors, this finding adds support to the notion that imagability plays a crucial role in influencing frequency estimates.

The Role of Emotionality in Frequency Estimation

The notion that the emotionality of a behavior descriptor constitutes the core attribute most responsible for the observed bias in frequency estimation hews closest to the operationalization of personal importance used in the present study--importance as the intensity of the evaluative emotion experienced when one contemplates behaving in the ways referred to by the behavior descriptor. Although Begg et al. (1986) suggested that "there is no evidence that emotional variables have any special status" (p.505), their study did not look at individual differences in the intensity of emotion experienced in reference to various stimuli and the effects of such differences on frequency estimation. The present study provides preliminary but confounded support for the role of emotionality in biases in frequency memory. Further research must address the complex task of separating

the role of the emotion-arousing potential of a stimulus from its image-arousing potential.

Putting the Picture Together: An Interactive Model of the Effects of Associativeness, Imagery, and Emotionality on Biases in Frequency Memory

Further study may determine that one of these three core semantic attributes is most responsible for increasing frequency estimates and creating memory biases. On the other hand, it could very well be that the three core attributes interact with one another in the memory process and that each loses its effectiveness when present without the others, especially in the case when the target stimuli are behaviors or behavior descriptors. That is, behavior descriptors that evoke vivid imagery may be more likely to cue emotional responses than will descriptors that evoke nonvivid imagery, and these emotional responses in turn may cue more vivid imagery. Evidence for such an interactive system between imagery and emotion in memory was discussed earlier in reference to the similarities in the patterns of findings for emotional and imagistic vividness in autobiographical memory. Similarly, the heightened imagery and emotionality of a behavior descriptor may lead the descriptor to become a more powerful retrieval cue, accessing more associations. The number of accessed associations may in turn contribute to the intensity of the imagability and emotionality of a behavior descriptor.

Whatever the relative contribution of these core semantic attributes, it is clear that a number of factors may influence the distinctiveness of memory traces of high versus low importance

behavior descriptors and that this enhanced distinctiveness may play a central role in the biases in frequency estimation obtained in the present study.

Availability and Biases in Frequency Memory

The present findings might also be explained in terms of the heightened availability of high importance over low importance words, in line with the perspective of Tversky and Kahnemann (1973) and others (Rose & Rowe, 1976; Rowe & Rose, 1977; Williams & Durso, 1986). High importance words might be recalled more easily than low importance words (e.g., more rapidly, or with less of a sense of subjective effort), and this ease of recall might be used as an heuristic in the judgment of relative frequency. This interpretation gains support from the findings of the literatures on accessible constructs and self-relevance reviewed earlier, which demonstrate enhanced recallability of accessible and personally relevant material over less accessible and relevant material (Higgins, King, & Mavin, 1982; Markus, 1977). The results of the present autobiographical memory study provide additional support for the availability explanation. As was reviewed earlier, although main effects for importance were not obtained on dimensions conceptually related to availability such as image vividness, emotional vividness, or recall latency, domain importance did emerge as significantly related to enhanced vividness in combination with other factors. Moreover, differences in the impact of levels of importance on availability of autobiographical events might be expected to be less clear than in

effects on availability of words that represent whole domains of behavior, given that, as was noted earlier, the content of the remembered stimulus is a great deal more complex in the case of an autobiographical event than in the case of a descriptive word. Certainly, the present data indicate the need to explore further the relationship between domain importance and availability and the effects of this relationship on frequency estimation.

An Integrated Perspective on Biases in Frequency Estimation

Rowe and Rose (1977) and Jonides and Naveh-Benjamin (1987) have argued for an integrated explanation of the levels of processing effects on frequency memory. The complexity of the processes involved in frequency estimation may indeed warrant trading parsimony for greater explanatory and descriptive validity (Jonides & Naveh-Benjamin, 1987). In the spirit of this perspective, it may be that biases in frequency estimation caused by differences in the personal importance of target stimuli are the result of both availability and distinctiveness. Furthermore, the core semantic attributes that affect distinctiveness may also affect availability. In addition, there may be person or stimulus differences in terms of which of the core semantic attributes lead to enhancement of trace distinctiveness and availability. For some persons and/or stimuli, imagery may play the largest part in enhancing distinctiveness and availability; for others, emotionality, and for others, verbal associativeness.

As was noted earlier, Rowe and Rose (1977) suggested that persons may begin the task of frequency estimation by utilizing information

provided by the relative availability of various items and may then move to a more systematic counting of individual traces. The present author would like to suggest that it may be that whether persons estimate frequency accurately or demonstrate a bias in frequency estimation depends on whether they engage both in a general, heuristic assessment of frequency and a count of the number of remembered instances or traces. Biases may emerge most strongly in those cases where the stimuli are so evocative, compelling, and distinctive that the person does not engage in a detailed count of traces, feeling confident that his or her heuristic assessment adequately represents the observed frequency of events. By this argument, if high importance behavior descriptors do represent more vivid, emotionally salient, and associatively rich stimuli, then it is likely that the remembering person will suspend detailed reflection and recollection of individual instances in the case of judging the frequency of such stimuli, favoring instead a judgment based on the compelling availability of these stimuli. In other words, there is often likely to be a negative relation between the availability of remembered material and the person's willingness and tendency to go beyond the step of an heuristically based judgment to a more detailed count of traces, and one condition likely to lead to a solely heuristically based judgment is the level of personal importance of the stimuli.

Patterns in the Estimation of Frequency of Occurrence
of High and Low Importance Behaviors and
Descriptors in Real-Life Contexts

Ultimately, questions about patterns and mechanisms of frequency

memory will need to address memory for frequency of real-life events in natural settings if research is to reflect the manner in which memory works in people's day-to-day lives (Neisser, 1982). The present data on persons' estimates of differential frequency of occurrence of behaviors and behavior descriptors in various life contexts provide preliminary indications of potentially fruitful questions towards which to direct naturalistic research efforts.

Valence Effects

The most striking difference between the results of the laboratory study on frequency and the data from subjects' estimations of real-life frequency is that, although valence did not significantly affect frequency estimates of behavior descriptors presented in a list, valence emerged as a main effect on estimates in all five real-life contexts examined. In estimates of the frequency with which domain words and/or referent behaviors are thought about in an average week, frequency of use of domain words in descriptions of self and of friends and acquaintances, and frequency of having been described by one's mother and father in terms of domain words, subjects reported positive behavior descriptors as being more frequent than negative behavior descriptors. Furthermore, in all cases in which valence interacted with domain importance, the interaction was ordinal and significant in respect to valence.

This pattern of findings may suggest one of two things: Either persons actually encounter and use negative behaviors and behavior descriptors less frequently than positive behaviors and descriptors in

various life contexts, or their recall is biased in the direction of higher frequencies of positive over negative behaviors and descriptors.

The absence of valence-based bias effects in the laboratory study would suggest that the strong valence effects obtained for the real-life estimates reflect a fairly accurate representation of actual differences in frequency of positive over negative words. However, it could be that actual frequencies of encounter with positive and negative behavior descriptors do actually differ, but that a moderate tendency to distort the frequency of positive over negative--as described by such researchers as Alloy and Abramson (1979) and Richards (1986)--enhances differences in frequency estimations. The issue can be definitively resolved only by comparing frequency estimates with records of actual frequency of encounter with positive and negative behaviors and behavior descriptors across a wide variety of real-life contexts.

Domain Importance Effects

The issue of accuracy versus bias in memory also emerges around the effects obtained for domain importance. In all three Importance x Valence interactions--for estimates of the frequency of thinking about behaviors and behavior domains in a week, of the frequency of being described in terms of the behavior words by one's mother, and by one's father--positive behavior descriptors are estimated to be more frequent than negative behavior descriptors, but the difference between positive and negative is greater in the case of high

importance domains than in the case of low importance domains. The obvious question here is whether this enhanced difference between positive and negative in the case of high importance domains is a function of enhanced attunement to the frequency of high importance behaviors and descriptors; a function of a reconstructive bias in retrieval processes, or difference in the relative availability of high importance positive versus high importance negative occurrences; or an accurate representation of the actual differences in frequencies.

Regarding this last possibility, it is likely that persons would attempt to increase the ratio of positive versus negative personal events in high importance domains and would be less concerned to do so in low importance domains. The result of such efforts to maximize the number of positive important events would be that, over time, the difference between the frequency of thinking about positive behaviors and descriptors versus negative behaviors and descriptors would be greater for high importance domains than for low importance domains. Likewise, the difference between frequencies of being described by important others in terms of positive versus negative behavior descriptors in high importance domains would be greater than in low importance domains. In other words, the experienced relative importance of a behavior domain is likely to have behavioral and interpersonal ramifications, which in turn will affect the contents of memory. Again, comparison between frequency estimates and descriptive data of encounters with high and low importance behaviors and words would shed light on the degree to which the present findings represent

processes of biased memorial reconstruction or accurate reflections of experienced frequencies.

Estimates of Parents' Descriptions: Naughtiness, Niceness, and Importance

The results of the findings for subjects' recollections of how frequently their parents described them in terms of important and unimportant positive and negative behavior words are interesting in a number of respects. First, as was alluded to above, the data may point to differences in the frequency with which certain behaviors become the focus of socialization efforts on the part of parents. Furthermore, the data may indicate differences between the types of behavior most likely to be commented upon by mothers and fathers, respectively. Although subjects recalled both mothers and fathers describing them more frequently in terms of high importance positive behaviors than low importance positive behaviors, this distinction was significant only in the case of descriptions by fathers. On the other hand, the number of descriptions in terms of high importance negative behaviors were seen as significantly fewer than low importance negative behaviors on the part of both mothers and fathers. The differences between subjects' accounts of fathers' and mothers' descriptions of them in terms of high and low importance positive behavior descriptors suggest that subjects experienced their fathers as being consistently more focused on their children's high importance behaviors, whereas mothers were experienced as differentially focused on high and low negative behaviors but less differentially attuned to high and low importance positive behaviors.

To the extent that subjects' frequency estimates were relatively accurate, these data may be explained either in terms of differences in what mothers and fathers are attuned to (or at least most likely to comment on) in their children's behavior, or the data may reflect differences in the roles mothers and fathers play for their children and, consequently, what types of behavior the child is likely to present to each parent for praise. In others words, children may present to their fathers for praise a higher proportion of high importance positive behaviors than low importance positive behaviors, especially given the fewer number of hours of contact children will have with their fathers versus with their mothers, at least in families where the father works full time and the mother works part time or is a full-time homemaker. Given greater access of mothers to their children and vice versa, there is a greater likelihood that children's positive behavior in both high and low importance domains will receive attention from mothers.

Thus, certain socialization experiences may occur that lead the child to label certain of his or her behaviors as highly important and others as less important. These key socialization experiences are remembered and direct the child to present high importance positive behaviors to parents more often than low importance positive behaviors, especially to fathers.

Similar causal issues arise in interpreting the reported pattern of high importance versus low importance negative behavioral ascriptions made by parents of their children. Do children behave less frequently in ways that violate important domains than

unimportant domains, thereby accruing fewer high importance negative attributions than low importance negative attributions from observing parents? Or do children, cognizant of the differential importance to parents of one behavior domain over the other, manage to hide or conceal more violations in high importance domains than in low importance domains? Or do these children, as young adults, retrospectively distort the frequency with which their parents attributed high importance negative versus low importance negative behavior traits to them? Again, the present data strongly suggest the need to examine the relation between adult children's memorial accounts of the frequency of socialization-based attributions by parents of various behavior traits and the actual occurrence of these attributions.

Implications of Present Data for the Role of Frequency Versus Intensity in Personal Importance

If the present data represent a fairly accurate account of the frequency with which children experience at least one form of socializing contact with their parents--that of having certain positive and negative behavior traits attributed to them--then these data provide additional albeit indirect support for the role of intensity in partitioning the person's experience of high and low importance domains of behavior. Recall that Higgins and King (1981) and others working with the accessible constructs framework hold that certain constructs become more accessible than others through sheer frequency of encounter with these constructs. However, the present

data suggest that this may hold only in the case of the positive pole of a bipolar behavior construct. Although subjects recalled their parents--especially their fathers--attributing high importance positive behavioral traits to them more frequently than low importance positive behavior traits, subjects recalled parents attributing high importance negative traits to them significantly less frequently than low importance negative traits. If high importance negative behavior traits are encountered significantly less frequently than low importance negative behavior traits in interactions with major socializers, then it may be that, although less frequent, the socialization encounters around high importance negative behaviors are significantly more intense than those around low importance negative behaviors.

In fact, the data from rankings of frequency of the average weekly rate of cognitive preoccupation with behavior domains, as well as the data on frequency of self-description, also indirectly support the notion that the intensity of encounter with a behavior domain plays an important role in the process by which one domain becomes more accessible or salient than another. To review, regarding frequency of thinking about the domains in a week, high importance positive behaviors and domains were estimated as significantly more frequently encountered than low importance positive behaviors and descriptors, but high importance negative and low importance negative behaviors and descriptors were not estimated to be thought about with different degrees of frequency. Regarding self-description, whereas females were found to use high importance behavior words to describe

themselves more frequently than low importance behavior words, males indicated the reverse pattern, reporting more frequent self-description in terms of low importance words than high importance words.

What would the Higgins and King (1981) model predict about the relative accessibility of high and low importance positive and negative constructs based on the present data? On the basis of the patterns of frequency rankings of thinking about behaviors and descriptors in an average week, the Higgins and King model of accessibility would predict that negative behaviors experienced as highly important and those experienced as relatively unimportant would be equally accessible. On the basis of the pattern of self-description rankings, Higgins and King would need to predict that, for females, high importance domains are more accessible than low importance domains, whereas for males, low importance domains are more accessible than high importance domains. The present framework, on the other hand, argues that frequency of activation of a construct may not be the sole or even the most important element of activation in leading to accessibility; rather, the intensity of the activating experience may play at least an equal role in the process.

Of course, the present study did not empirically establish the relationship between the operationalization of domain importance and that of construct accessibility. Further study needs to address this relationship. However, as was pointed out in the introductory chapter of this essay, the notion of accessibility seems to assume key aspects of the notion of personal importance which are explicitly incorporated

into the latter concept. In any case, it seems unlikely that high importance domains will be found less accessible than low importance domains, especially in light of the obtained bias effects on frequency estimates of high versus low importance words in the controlled laboratory portion of this study.

The Relation Between Estimates of Parents'
Attributions, Self-Description and
Other-Description

The data suggest that the frequency with which persons are described by their parents in terms of high and low importance positive and negative behaviors does not directly relate to relative frequencies of self- and other-descriptions in terms of these behaviors. Although in all cases positive behavior descriptors were estimated as more frequent than negative descriptors, this pattern alone cannot be seen as evidence of the impact of parental attributions on current use of domain words in descriptions of self and other. The Importance x Valence interaction, which characterizes subjects' rankings of their parents' attributions about them, was absent in frequency rankings of self- and other-descriptions, suggesting that the relationship between parents' descriptions of their children and their children's self-descriptions and descriptions of others is not one of direct influence. Although more objective data are needed to determine the exact nature of this relationship, the present data at least suggest that young adults do not view their patterns of use of behavior descriptors in characterizing either

themselves or friends and acquaintances to coincide with their remembrances of how their parents described them.

Two other patterns in the self- and other-description data are somewhat intriguing. First, the gender difference in frequency of use of high and low importance behavior descriptors in self-description corresponds to the pattern obtained with a different sample of subjects in the autobiographical memory study, namely, males seem to emphasize low importance domains over high importance domains, whereas females emphasize high over low importance domains.

Second, the absence of importance effects for rankings of descriptions of friends and acquaintances suggests that, as a group, the subjects sampled in the present study have contact with a varied enough group of peers to make general application of their own high and low importance domains to these others impossible. More broadly, the data suggest that persons are not entirely solipsistic or self-centered either in the friends they pick or in the attributions they make of others.

Summary: The Effects of Domain Importance on Frequency Memory

The present study has established that domain importance affects frequency estimates. This was shown in a controlled laboratory experiment involving exposure to a word list, as well as in retrospective rankings of the actual frequency of occurrence of various behaviors and behavior descriptors in persons' lives. In the case of estimating the frequency of words presented in a controlled setting, domain importance appears to bias frequency memory in the

direction of estimating a higher frequency of high over low importance words. This bias occurs for both genders and regardless of valence.

In the case of estimating frequency of words thought about, encountered, or used in a variety of social contexts, domain importance interacts with other variables: Domain importance interacts with valence in the frequency of thinking about behaviors and domain words in a week, as well as in recollections of attributions made by mothers and fathers; and domain importance interacts with gender in frequency of use of domain words in self-description.

Throughout this discussion a number of research questions were raised, the answers to which would greatly clarify the nature and cause of the present results. In addition to these needed inquiries, further exploration of the role of domain importance in frequency memory is needed to determine the conditions under which the enhanced sensitivity to frequency of personally important stimuli leads to enhanced accuracy of estimations as opposed to bias in estimations. It would also be interesting to determine the degree to which personally important stimuli can bias recall. In other words, how much greater must the objective frequency ratio of low to high importance stimuli be before persons accurately estimate the preponderance of low over high importance stimuli? Such a study might establish a sort of just-noticeable difference for frequency memory of salient, distinctive stimuli versus relatively nonsalient, nondistinctive stimuli.

Most importantly, the present findings point to the need to look at individual differences in the cognitive relation between persons and stimuli in the study of memory for frequency. As those who support the automaticity perspective have repeatedly asserted, persons' capacity to remember the frequency of events provides essential information for day-to-day coping with the environment. What those supporting the automaticity perspective overlook is that persons differ in terms of which events are more important to remember than others. The frequency of these important events, along with other features, may thus be better recalled than the frequency of other, less important events. Moreover, the effects of personal importance on memory for frequency may occur automatically, without conscious deliberation or intention. Put more directly, for any given person the relative frequencies of various events are important, but some frequencies are more important than others.

CHAPTER IV

PERSONAL IMPORTANCE AND MEMORY: GENERAL

IMPLICATIONS OF THE PRESENT FINDINGS

The experiments reported here establish that the personal importance of behavior domains affects two areas of memory which together constitute much of day-to-day memorial activity: autobiographical memory and memory for frequency of occurrence. Thus, personal importance plays a central role in the deployment of memory in adaptation to the environment.

To recapitulate briefly, memories of personal events in high importance domains were found to differ from memories of events in low importance domains on a number of central dimensions. Personal importance influences a number of aspects of the experienced recall of events, the affective attributes of life memories, retrospective beliefs about the consequentiality, frequency and predictability of life events, and the experienced self-descriptiveness of autobiographical memories. Moreover, personal importance plays a crucial role in mediating the effects of other factors on attributes of autobiographical memory. In other words, personal importance figures prominently in creating the richness and complexity of autobiographical memory.

Whereas the study on autobiographical memory demonstrated the role of personal importance in the rich and complex area of personal memories, the study on memory for the frequency with which events occur demonstrated the impact of personal importance in a more

straightforward memorial task. In a controlled laboratory setting with objectively presented stimuli, the personal importance of behavior domains clearly influenced estimates of the relative frequency of words that describe these domains. Personal importance was also found to have meaningful effects on persons' estimates of the frequency with which they use, think about, or have encountered domain descriptors in real-life social contexts. As in the case of autobiographical memory, personal importance was found to mediate the impact of other variables on these estimates of real-life frequency.

These findings have several broad implications for an understanding of memory, in terms of general theory as well as in terms of the pragmatic application of memory to adaptation.

First, it is clear that theory and research in memory and cognition must increasingly address the impact of differences between persons in the meaningfulness of the objects of attention. Memorial processes cannot be assumed to obtain the same results for all persons and all objects of attention. That is, differences in the ways in which persons regard various objects or contents of experience may influence the outcome of memorial processes.

Second, these differences in the meaningful relation between persons and the objects of their attention are themselves likely to be largely a function of differences in past experience. Often, these experiences occur in social contexts, that is, contexts involving other perceivers and actors. This is particularly true when the objects of attention are human behaviors. These social experiences are themselves stored in memory. Thus, as was suggested in the first

chapter, the memorial distillates of past experiences with various events come to influence present and future memorial activity.

Third, as was suggested earlier, these influences of past upon present memorial activity can be viewed as automatic in nature, not in the more restricted sense of unsusceptibility to individual differences (Hasher & Zacks, 1979, 1984), but in the broader sense of effects that occur without deliberation, intention, or effort on the part of the cognizing subject. What is being argued is that differences between persons in the meaning of various contents of experience have systematic, automatic effects on memory. The present studies have documented these systematic, automatic effects for one central aspect of the relation between the subject and the contents of experience, namely, the degree to which the subject finds these contents personally important.

The Automatic Effects of Personal Importance:
Adaptation or Error?

The results of the frequency memory study indicated that domain importance can lead to a systematic bias in estimates of the relative frequency of stimulus events, such that high importance events are recalled as being more frequent than low importance events despite objectively equal presentation. And although the stimulus events in the autobiographical memory study were not available for experimental control, it is likely that domain importance leads to systematic emphasis upon certain memories or aspects of memories in a manner that could be construed as modifying or even distorting the "objective" features of the remembered events. In fact, the unanticipated but

consistent pattern of social context effects upon autobiographical memory demonstrate that certain factors may lead to reconstruction of autobiographical memories. The social context within which persons recall life events represents a relatively short-term reconstructive influence upon autobiographical memory; trends in the personal importance of behavior domains may represent relatively long-term, continuous influences.

Practically speaking, it can be asked whether such biases in memory represent aids to adaptation or problematic disruptions in the activity of coming to know the world. This issue returns the present essay to the broad distinctions between approaches to the study of cognition which were addressed in the first chapter. A brief examination of the debate about the value of unintentional, systematic effects upon cognition will clarify the issue of the value of such effects on autobiographical memory and memory for frequency.

Underlying the move toward models of social perception that encompass both effortful, deliberate forms of cognition as well as automatic, nondeliberate processes (Bargh, 1982, 1984; Costanzo & Dix, 1983; Hasher & Zacks, 1979, 1984; Langer, 1978; Logan & Cowan, 1984; Posner & Snyder, 1975; Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977; Zajonc, 1980) is a conception of the purpose of perception, which differs markedly from the conception held by attribution or inference theorists. As was discussed in the first chapter, the latter group of theorists generally presuppose, that good information processing hews closely to the laws of logical inference, and that the ultimate goal of cognition should be to avoid biases that

might lead to inferences not fully informed by all available stimuli. Theories that incorporate both deliberate and nondeliberate forms of cognition, on the other hand, see perception and cognition as tools of adaptation (McArthur & Baron, 1983). These theories hold that certain perceptual tasks may require logical inference, whereas others may be best served by selectively attending to stimuli and responding in an automatic fashion (Fiske, 1980; Gibson, 1979; McArthur & Baron, 1983; Zajonc, 1980).

In their "ecological theory" of social perception, McArthur & Baron (1983) have eloquently argued for the adaptiveness of nondeliberate, experience-based processes of social perception. Their views nicely summarize the general orientation shared by a number of researchers (Fiske, 1980; Higgins & King, 1981; Langer, 1978; Posner & Snyder, 1975; Woody & Costanzo, 1985; Zajonc, 1980), differences in theoretical language notwithstanding. McArthur and Baron (1983) built upon Gibson's (1979) premise that "perception is for doing." They noted that perception centers on identifying the "affordances" or opportunities for action presented by events. Because a perceiver's actions and goals vary over time and situation, certain events or aspects of events will be useful or relevant to a particular perceiver at particular times but not at others. In Gibson's (1979) words, "Affordances are properties of things taken with reference to an observer . . ." (p. 137). Perceivers are attuned or oriented to certain features of any given stimulus situations or event depending on their goals in the present moment as well as on their previous experience with this type of event. Previous experience with an event

frequently leads to increased ability to differentiate meaningful patterns and affordances presented by the event. In turn, a perceiver's previous experience informs and is informed by long-term goals relevant to the social event perceived.

The ecological position holds that increased differentiation does not mean increased use of inferential modes of information processing. On the contrary, perceivers' previous experience with events of certain types can lead them to perceive the event extremely rapidly and automatically and to attend to only a limited amount of information--for instance, in the perception of negative affect (Woll & Martinez, 1982).

Thus, whereas theories that adhere to a rational baseline model insist that systematic forms of error in inference which lead to selectivity in information pickup and processing result in much distorted social knowledge (Hastorf, Schneider, & Polefka, 1970; Miller & Ross, 1975; Nisbett & Ross, 1980; Ross, 1977), the ecological position holds that such selectivity has an adaptive function and is not rightly designated as "error." McArthur and Baron (1983) wrote:

Within an inferential framework, the criterion for accuracy is the logicity of one's reasoning processes, and error occurs when one manifests problems in reasoning. Within the latter framework, error and bias are synonymous. However, within an ecological framework, bias is different from error: Bias is simply a matter of selective attention and action, and whether a given bias leads to error in adaptive behavior is an empirical, not a logical, problem.
(p. 230)

Perceivers develop biases as a result of experiences that attune them to aspects of a stimulus array that afford them opportunities or

threats; errors result from "overgeneralization of highly adaptive perceptual attunements" (McArthur & Baron, 1983, p. 231).

McArthur and Baron's arguments have both specific and more general applications to the present findings on memory. As can be seen from McArthur and Baron's treatment of the issue, work on biases in social cognition has largely focused on the issue of the ways in which short- and long-term attunements result in selective attention. Although the present studies did not separately assess deployment of attention, selective attention was suggested as a possible factor in some of the effects of personal importance on autobiographical memory and memory for frequency of occurrence. For instance, when persons recalled emotionally negative life events, novelty and importance often did not have the differentiating effects that they had for memories of positive events. This general valence pattern was described as possibly resulting from negativity in a memory "flooding the field," preempting differentiation on the basis of other factors. In McArthur and Baron's terms, recall of negative events may involve selective attention borne of a history of personal adaptation to such events.

Likewise, as was suggested earlier, it may be that the differences obtained in the recallability of high versus low importance events and the biases observed in frequency estimates of high versus low importance behavior descriptors result from the increased salience of high importance memories and descriptors, and that these differences in salience result from differential attention to high versus low importance stimuli during encoding.

More generally, the perspective on bias offered by McArthur and Baron and others suggests that certain stimuli are more important to the perceiver and rememberer than others. These highly important stimuli may resultingly become overrepresented in the person's memorial response to his or her world. This overrepresentation may take the form of the experienced intensity of a memorial stimulus, as in high vividness, or in frequency, as in judgments of greater preponderance of high importance stimuli over stimuli of lesser importance.

Furthermore, this perspective argues that there is a "method to this madness" of bias. Persons become highly and automatically attuned to particular categories of events because of a history with these events. In terms of the personal importance of behavior domains, it is obvious that personal experiences within domains lead to this enhanced attunement. If "perception is for doing," then memory must be viewed as the crucial link between what was done and what is to be done. Memory represents the continuity of concerns, attunements, differentiations, and sensitivities which guide adaptation to the person's world.

As McArthur and Baron (1983) argued, bias becomes error when the person's habitual manner of attending to and highlighting particular events over others extends beyond relevant parameters. The same can be argued for the biasing effects of personal importance on memory. In some sense, these maladaptive extensions of selective attunements and recall constitute the core of many psychopathological phenomena. As was noted earlier, heightened attunement and recall of negative

events and ideas represent core aspects of depression (Beck et al., 1979; APA, 1987). Other identified clinical syndromes also involve problematic biases in cognition. These biases are documented and discussed in numerous texts on psychopathology (e.g., MacKinnon & Michels, 1971). For instance, Shapiro (1965) has eloquently captured the "cognitive styles" of obsessive-compulsive, paranoid, hysterical, and impulsive disorders. Each of these cognitive styles centers upon a few core, salient constructs which represent pathogenic biases that sustain the maladaptive world view of the troubled person.

Importantly, such maladaptive cognitive and emotional biases originate as necessary adaptations to problematic life circumstances. The psychological responses of trauma victims demonstrate this point unambiguously. For instance, the rape victim whose tremendous fear of dark places and of men persists years beyond her rape experience has carried an intensity of attunement to particular features of her environment beyond its adaptive purpose. However, these fears can be viewed as largely adaptive in the immediate aftermath of being raped.

The present essay opened with the sentence, "Our memory represents the world to us." Autobiographical memory was noted to determine a large component of one's sense of self. And memory for the frequency with which events occur was held to constitute a central aspect of one's orientation to the world. It can be argued that the automatic, biasing effects of personal importance on autobiographical memory and memory for frequency of occurrence serve to define the particular relationship of the person to his or her world, and to maintain some consistency in the person's sense of self in the world.

Greenwald (1980) has persuasively argued that so-called biases of perception and cognition are necessary in order to preserve a sense of self, that the continued existence of the individual's "ego" depends on the frequent operation of such biases.

The present argument suggests that the biases in memory that emerge from the relative personal importance of behavior domains may preserve consistency, not only in one's sense of self, but also in one's view of the defining characteristics of the world. And as McArthur and Baron and other "dual-process" theorists suggest, both deliberate processes of inference and automatic "biased" response must play a part in how persons adapt to their world. Without the capacity to examine the contents of perception and amend one's accrued knowledge of the world, persons would become highly solipsistic in their beliefs and memories; without the differentiating and biasing effects of personal importance upon memory, there would not be cognitively distinct persons at all.

APPENDIX A
QUESTIONNAIRES AND ANSWER SHEETS

Student # _____

Campus Phone _____

Survey of Feelings About Behavior

Name _____ Gender: Male _____ Female _____

Birthdate _____

Instructions: On the following page is a list of words which describe behaviors. Please read each descriptive word and the related words in parentheses. For each behavior described, take a moment and conjure up an occasion or several occasions in the past when you have acted in similar ways. Or you may imagine a scene that you have never experienced. The image can be sharp or vague, vivid or hazy--the important thing is that you take a moment to get a sense of how the behavior described relates to you.

Once you have gotten an image of yourself acting in the ways described, rate how good or positive you would feel about yourself if you were to act in the ways you described. By "good" or "positive" we mean feelings like being proud, pleased, delighted, thrilled, satisfied, and happy. Use the rating scale next to each descriptive word to indicate how good or positive you would feel about yourself. Use any number from 1 (neutral) through 7 (extremely good/positive).

After you rate your feelings about each behavior, go back over the list and place a 1 in the space next to the behavior which would make you feel best (most positive) about yourself. Place a 2 next to the one behavior which would make you feel next best--that is, which would give you the second highest amount of good or positive feelings about yourself. Do this for all 18 behaviors described, using the numbers 1 through 18 only once each. The behavior which would give you the least amount of good or positive feelings about yourself, relative to the others, should be ranked 18.

Work slowly and think carefully. If you change your mind, feel free to change your answers. The end result should show how you really feel. Your name and campus phone number have been requested only so that you may be contacted later in the semester for another study. Your responses on this questionnaire will be seen by no one other than the experimenter. Thus, please try to give your true feelings about the behaviors described on the next page as they relate to you.

REMEMBER: 1=Neutral, 7=Extremely good/positive feelings

-----AMBITIOUS (hard-working, aspiring)	1	2	3	4	5	6	7
-----BROADMINDED (open-minded)	1	2	3	4	5	6	7
-----CAPABLE (competent, effective)	1	2	3	4	5	6	7
-----CHEERFUL (lighthearted, joyful)	1	2	3	4	5	6	7
-----CLEAN (neat, tidy)	1	2	3	4	5	6	7
-----COURAGEOUS (standing up for your beliefs)	1	2	3	4	5	6	7
-----FORGIVING (willing to pardon others)	1	2	3	4	5	6	7
-----HELPFUL (working for the good of others)	1	2	3	4	5	6	7
-----HONEST (sincere, truthful)	1	2	3	4	5	6	7
-----IMAGINATIVE (novel, creative)	1	2	3	4	5	6	7
-----INDEPENDENT (self-reliant, self-sufficient)	1	2	3	4	5	6	7
-----INTELLECTUAL (intelligent, reflective)	1	2	3	4	5	6	7
-----LOGICAL (consistent, rational)	1	2	3	4	5	6	7
-----LOVING (affectionate, tender)	1	2	3	4	5	6	7
-----OBEDIENT (dutiful, respectful)	1	2	3	4	5	6	7
-----POLITE (courteous, well-mannered)	1	2	3	4	5	6	7
-----RESPONSIBLE (dependable, reliable)	1	2	3	4	5	6	7
-----SELF-CONTROLLED (restrained, self-disciplined)	1	2	3	4	5	6	7

The next part of this survey asks you to indicate your feelings about behaviors which are exactly opposite to those which you just encountered. Please avoid the natural temptation to try to be consistent with what you've stated in the previous part of the survey. For instance, if you used a 4 to describe how good or positive you would feel if you acted in a polite fashion, you need not use a 4 to describe how bad or negative you would feel if you acted in an impolite fashion. Likewise, if you placed a 6 next to POLITE to describe how such behavior would make you feel relative to the other listed behaviors, you need not place a 6 next to IMPOLITE to describe how bad or negative such behavior would make you feel. Rather, approach this next portion of the survey afresh. We are interested in your true feelings about various behaviors, not your ability to make consistent ratings and rankings on surveys.

Student # _____

Campus Phone _____

Survey of Feelings About Behavior

Name _____ Gender: Male _____ Female _____

Birthdate _____

Instructions: On the following page is a list of words which describe behaviors. Please read each descriptive word and the related words in parentheses. For each behavior described, take a moment and conjure up an occasion or several occasions in the past when you have acted in similar ways. Or you may imagine a scene that you have never experienced. The image can be sharp or vague, vivid or hazy--the important thing is that you take a moment to get a sense of how the behavior described relates to you.

Once you have gotten an image of yourself acting in the ways described, rate how bad or negative you would feel about yourself if you were to act in the ways you described. By "bad" or "negative" we mean feelings like being ashamed, guilty, concerned, anxious, upset, worried, and angry. Use the rating scale next to each descriptive word to indicate how bad or negative you would feel about yourself. Use any number from 1 (neutral) through 7 (extremely bad/negative).

After you rate your feelings about each behavior, go back over the list and place a 1 in the space next to the behavior which would make you feel worst (most negative) about yourself. Place a 2 next to the one behavior which would make you feel next worst--that is, which would give you the second highest amount of bad or negative feelings about yourself. Do this for all 18 behaviors described, using the numbers 1 through 18 only once each. The behavior which would give you the least amount of bad or negative feelings about yourself, relative to the others, should be ranked 18.

Work slowly and think carefully. If you change your mind, feel free to change your answers. The end result should show how you really feel. Your name and campus phone number have been requested only so that you may be contacted later in the semester for another study. Your responses on this questionnaire will be seen by no one other than the experimenter. Thus, please try to give your true feelings about the behaviors described on the next page as they relate to you.

REMEMBER: 1=Neutral, 7=Extremely good/positive feelings

-----UNAMBITIOUS (lazy, unaspiring)	1	2	3	4	5	6	7
-----NARROWMINDED (close-minded)	1	2	3	4	5	6	7
-----INCAPABLE (incompetent, ineffective)	1	2	3	4	5	6	7
-----GLOOMY (glum, morose)	1	2	3	4	5	6	7
-----DIRTY (messy, untidy)	1	2	3	4	5	6	7
-----COWARDLY (not standing up for your beliefs)	1	2	3	4	5	6	7
-----UNFORGIVING (unwilling to pardon others)	1	2	3	4	5	6	7
-----UNHELPFUL (hindering, failing to aid others)	1	2	3	4	5	6	7
-----DISHONEST (insincere, deceitful)	1	2	3	4	5	6	7
-----UNIMAGINATIVE (lacks daring, uncreative)	1	2	3	4	5	6	7
-----DEPENDENT (needy, overly reliant on others)	1	2	3	4	5	6	7
-----STUPID (unintelligent, unreflective)	1	2	3	4	5	6	7
-----ILLOGICAL (inconsistent, irrational)	1	2	3	4	5	6	7
-----UNLOVING (indifferent, cold)	1	2	3	4	5	6	7
-----DISOBEDIENT (oppositional, disrespectful)	1	2	3	4	5	6	7
-----IMPOLITE (discourteous, ill-mannered)	1	2	3	4	5	6	7
-----IRRESPONSIBLE (undependable, unreliable)	1	2	3	4	5	6	7
-----IMPULSIVE (unrestrained, undisciplined)	1	2	3	4	5	6	7

Instructions: Everyone has positive as well as negative traits or attributes. Use the following scales to indicate your positive and negative attributes. Circle the number on each scale which best describes you.

- UNAMBITIOUS -1----2----3----4----5----6----7- AMBITIOUS
- NARROWMINDED -1----2----3----4----5----6----7- BROADMINDED
- INCAPABLE -1----2----3----4----5----6----7- CAPABLE
- GLOOMY -1----2----3----4----5----6----7- CHEERFUL
- DIRTY -1----2----3----4----5----6----7- CLEAN
- COWARDLY -1----2----3----4----5----6----7- COURAGEOUS
- UNFORGIVING -1----2----3----4----5----6----7- FORGIVING
- UNHELPFUL -1----2----3----4----5----6----7- HELPFUL
- DISHONEST -1----2----3----4----5----6----7- HONEST
- UNIMAGINATIVE -1----2----3----4----5----6----7- IMAGINATIVE
- DEPENDENT -1----2----3----4----5----6----7- INDEPENDENT
- STUPID -1----2----3----4----5----6----7- INTELLECTUAL
- ILLOGICAL -1----2----3----4----5----6----7- LOGICAL
- UNLOVING -1----2----3----4----5----6----7- LOVING
- DISOBEDIENT -1----2----3----4----5----6----7- OBEDIENT
- IMPOLITE -1----2----3----4----5----6----7- POLITE
- IRRESPONSIBLE -1----2----3----4----5----6----7- RESPONSIBLE
- IMPULSIVE -1----2----3----4----5----6----7- SELF-CONTROLLED

List the four positive behaviors or attributes from the scales above which best describe you. List them in order of how well they describe you, with #1=the positive behavior which best describes you.

List the four negative behaviors or attributes from the scales above which best describe you. List them in order of how well they describe you, with #1=the negative behavior which best describes you.

Subject # _____

Memory # _____

Date _____

MEMORY DESCRIPTIONS

1. Emotional Vividness: Rate how clearly or vividly you remember the emotions you experienced during the event referred to in this memory.

1	2	3	4	5	6	7
no memory of emotions						clear as original

2. Image Vividness: Rate how clearly or vividly you remember details of what happened, what the scene looked like--in short, how clear or vivid is your image of the event referred to in this memory?

1	2	3	4	5	6	7
no memory						clear as original

3. Pleasantness: Rate how pleasant this memory is for you.

1	2	3	4	5	6	7
equal to my most unpleasant memory			neutral			equal to my most pleasant memory

4. Significance: Rate how important this event has been in your life.

1	2	3	4	5	6	7
made no difference in my life						changed my life as much as any event

5. Novelty: Rate how unusual or unique this event was to you.

1	2	3	4	5	6	7
totally routine						equal to my most unusual event

6. Frequency: Rate how many times you have thought about this memory or told someone about this memory before today.

1	2	3	4	5	6	7
never						as often as any event in my life

7. Confidence: Rate how confident you are that your memory accurately represents the event as it happened.

1	2	3	4	5	6	7
as little confidence as my faultiest memory						as confident as of my most accurate memory

Subject # _____

8. Complexity: Rate how complex you feel the remembered event was. Were there lots of important details, multiple meanings for behaviors, or intricate connections between aspects of the event? Or was the event's meaning fairly simple to comprehend?

1	2	3	4	5	6	7
as simple as the simplest event in my life					as complex as the most complex event in my life	

9. Impact: Rate the degree of effect the event had on you at the time. Did you change your behavior or life in some way as a result of this event?

1	2	3	4	5	6	7
as little impact as any event in my life					as great an impact as any event in my life	

10. Control: Rate the degree of control you believe you had over the remembered event.

1	2	3	4	5	6	7
totally out of my control					totally under my control	

11. Desirability: Rate how desirable this event was for you.

1	2	3	4	5	6	7
as undesirable as any in my life					as desirable as any in my life	

12. Expectancy: Rate how expected this event was for you.

1	2	3	4	5	6	7
totally unexpected					completely expected	

13. Age-Relatedness: Rate how much you believe this event's occurrence had to do with your age at the time it happened.

1	2	3	4	5	6	7
had nothing at all to do with my age					had everything to do with my age	

14. Likelihood: Rate how likely is that this event or something similar will happen to you in the future.

1	2	3	4	5	6	7
extremely unlikely					extremely likely	

Why do you think that you remembered this particular event? _____

Subject # _____

Focus: Most human behavior can be looked at in terms of two elements:
 (1) the outcomes of the behavior--that is, what actually happened, and
 (2) the person's intentions or motivations.

At times, our intentions match our actions: for instance, we may try to be punctual, and arrive on time; or we may try to be late and actually arrive late. At other times, intentions and outcomes don't match: we may arrive on time even though we didn't try to do so, or despite valiant attempts to be late! Contrariwise, we may arrive late despite valiant attempts to be on time.

Keeping in mind these distinctions regarding intentions and outcomes in behavior, please make the following ratings:

1. Rate the degree to which your memory for this even focuses on the outcomes of your behavior versus the intentions behind your behavior.

	1	2	3	4	5	6	7	
intentions								outcomes

2. Rate the degree to which you feel your intentions matched your outcomes in this event.

	1	2	3	4	5	6	7	
completely unmatched								perfectly matched

3. Rate how good or bad your intentions were in this event.

	1	2	3	4	5	6	7	
as bad as my worst intentions								as good as my best intentions

Subject # _____

Memory Rankings

You have spent some time thinking about each of your 8 memories individually. Now I would like you to compare the memories to each other in terms of some of the qualities you just used to describe each memory.

Please rank the 8 memories you produced today in terms of the qualities listed below. For each ranking task, 1=Most, 8=Least. For example, if memory #3 was your most pleasant of the 8 memories, you would place a 1 in the space provided next to the 3. If memory #6 was your least pleasant memory of the 8 memories, you would put an 8 next to the 6. Please feel free to refer back to the previous pages to remind yourself of the specific definitions of each of the qualities.

1. Emotional Vividness

Memory #:

1. ____

2. ____

3. ____

4. ____

5. ____

6. ____

7. ____

8. ____

2. Image Vividness

Memory #:

1. ____

2. ____

3. ____

4. ____

5. ____

6. ____

7. ____

8. ____

3. Pleasantness

Memory #:

1. ____

2. ____

3. ____

4. ____

5. ____

6. ____

7. ____

8. ____

4. Significance

Memory #:

1. ____

2. ____

3. ____

4. ____

5. ____

6. ____

7. ____

8. ____

5. Frequency

Memory #:

1. ____

2. ____

3. ____

4. ____

5. ____

6. ____

7. ____

8. ____

6. Complexity

Memory #:

1. ____

2. ____

3. ____

4. ____

5. ____

6. ____

7. ____

8. ____

7. Memories and You in the Present.

Psychologists frequently look to a person's memories to get an idea of what that person is like in the present. Rank your 8 memories in terms of how well they capture what you're like now.

1=Captures me in the present most well, 8=Captures me in the present least well.

Memory #:

1.____ 5.____

2.____ 6.____

3.____ 7.____

4.____ 8.____

Subject # _____

Date of Experiment _____ Time _____

Memory Experiment: Answer Sheet

Instructions: Below are six pairs of words. These words appeared in the set of words you just saw on the screen. For each pair, circle the word which you remember occurring more frequently in the set. If you don't remember which you saw more frequently of the two, guess. Do not pass over any pairs without circling a choice.

BROADMINDED / NARROWMINDED

UNFORGIVING / NARROWMINDED

BROADMINDED / UNFORGIVING

UNFORGIVING / FORGIVING

FORGIVING / BROADMINDED

NARROWMINDED / FORGIVING

Subject # _____

RANKINGS

For the following ranking tasks, 1=MOST FREQUENTLY, 4=LEAST FREQUENTLY. Use each rank number (1 through 4) only once for each ranking task; make sure each word gets a rank.

1. Rank how frequently you think about each of these words and/or the behaviors they refer to in an average week (7 day period).

<u>Rank</u>	<u>Word/Behavior</u>
_____	broadminded
_____	unforgiving
_____	narrowminded
_____	forgiving

2. Rank how frequently you have used these words to describe yourself or your behavior since you arrived at Duke this semester.

_____	broadminded
_____	unforgiving
_____	narrowminded
_____	forgiving

3. Rank how frequently you have used these words to describe your friends and acquaintances since you arrived at Duke this semester. Acquaintances can include both people you like and people you dislike.

_____	broadminded
_____	unforgiving
_____	narrowminded
_____	forgiving

4. Rank how frequently your mother has used these words to describe you and your behavior.

<u>Rank</u>	<u>Word/Behavior</u>
_____	broadminded
_____	unforgiving
_____	narrowminded
_____	forgiving

5. Rank how frequently your father has used these words to describe you and your behavior.

_____	broadminded
_____	unforgiving
_____	narrowminded
_____	forgiving

APPENDIX B

ANALYSIS OF VARIANCE TABLES FOR ALL DEPENDENT VARIABLES IN
AUTOBIOGRAPHICAL MEMORY STUDY AND FREQUENCY MEMORY STUDY

The analysis of variance tables are arranged by study. The tables for the autobiographical variables are arranged in terms of the sources from which data were drawn for the analyses, with tables for the six analyses based on the combined rating-ranking index presented first, followed by the table for the analysis based on rankings only, followed by the tables for the analyses based on ratings only, followed by the tables for analyses based on memory dating and recall latencies, respectively.

Variables in Autobiographical Memory Study

<u>Variable</u>	<u>Table</u>
Emotional Vividness	13
Image Vividness	14
Memory Pleasantness	15
Event Significance	16
Frequency of Rehearsal	17
Event Complexity	18
Memory Self-Descriptiveness	19
Event Novelty	20
Confidence of Recall	21
Event Impact	22
Perceived Control	23
Event Desirability	24
Expectancy	25
Age-Relatedness	26
Event Likelihood	27
Relative Focus on Intentions vs. Outcomes	28
Intention - Outcome Match	29
Good vs. Bad Intentions	30
Memory Dating	31
Recall Latency	32

Variables in Frequency of Occurrence Study

<u>Variable</u>	<u>Table</u>
Weekly Encounter with Domain Words	33
Use of Domain Words in Self-Description	34
Use of Domain Words in Descriptions of Others	35
Frequency of Description by Mother in Terms of Domain Words	36
Frequency of Description by Father in Terms of Domain Words	37

Table 13
Summary of Mixed Factorial Analysis of
Variance for Emotional Vividness
 (Data Based on Combined Rating-Ranking Index)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.005	0.005	0.01	0.94
Gend	1	0.234	0.234	0.27	0.61
Error	39	34.289	0.879		
Nov	1	6.095	6.095	1.59	0.21
Nov x T.F.	1	3.743	3.743	0.98	0.33
Nov x Gend	1	3.637	3.637	0.95	0.34
Error (Nov)	39	149.417	3.831		
Imp	1	1.574	1.574	0.51	0.48
Imp x T.F.	1	3.344	3.344	1.08	0.31
Imp x Gend	1	0.141	0.141	0.05	0.83
Error (Imp)	39	121.300	3.110		
Val	1	0.307	0.307	0.12	0.73
Val x T.F.	1	0.843	0.843	0.33	0.57
Val x Gend	1	0.208	0.208	0.08	0.78
Error (Val)	39	98.628	2.529		
Nov x Imp	1	35.673	35.673	16.77	0.001
Nov x Imp x T.F.	1	5.796	5.796	2.73	0.11
Nov x Imp x Gend	1	3.708	3.708	1.74	0.19
Error (Nov x Imp)	39	82.940	2.127		
Nov x Val	1	7.083	7.083	3.14	0.08
Nov x Val x T.F.	1	0.627	0.627	0.28	0.60
Nov x Val x Gend	1	1.042	1.042	0.46	0.50
Error (Nov x Val)	39	88.012	2.257		
Imp x Val	1	3.436	3.436	1.44	0.23
Imp x Val x T.F.	1	0.059	0.059	0.02	0.88
Imp x Val x Gend	1	2.725	2.725	1.15	0.29
Error (Imp x Val)	39	92.767	2.379		
Nov x Imp x Val	1	7.723	7.723	3.72	0.06
Nov x Imp x Val x T.F.	1	2.780	2.780	1.35	0.25
Nov x Imp x Val x Gend	1	4.469	4.469	2.15	0.15
Error (Nov x Imp x Val)	39	80.949	2.076		

Table 14
Summary of Mixed Factorial Analysis of Variance for Image Vividness
 (Data Based on Combined Rating-Ranking Index)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.566	0.566	0.81	0.37
Gend	1	0.012	0.012	0.02	0.89
Error	39	27.154	0.696		
Nov	1	7.590	7.590	1.94	0.17
Nov x T.F.	1	4.302	4.302	1.10	0.30
Nov x Gend	1	2.394	2.394	0.61	0.44
Error (Nov)	39	152.850	3.919		
Imp	1	5.169	5.169	1.74	0.20
Imp x T.F.	1	0.855	0.855	0.29	0.60
Imp x Gend	1	4.398	4.398	1.48	0.23
Error (Imp)	39	116.111	2.977		
Val	1	4.286	4.286	2.07	0.16
Val x T.F.	1	0.326	0.326	0.16	0.69
Val x Gend	1	7.039	7.039	3.40	0.07
Error (Val)	39	80.845	2.073		
Nov x Imp	1	14.426	14.426	5.19	0.03
Nov x Imp x T.F.	1	5.702	5.702	2.05	0.16
Nov x Imp x Gend	1	0.893	0.893	0.32	0.57
Error (Nov x Imp)	39	108.461	2.781		
Nov x Val	1	16.269	16.269	9.73	0.003
Nov x Val x T.F.	1	10.796	10.796	6.46	0.01
Nov x Val x Gend	1	2.328	2.328	1.39	0.25
Error (Nov x Val)	39	65.207	1.672		
Imp x Val	1	2.407	2.407	1.01	0.32
Imp x Val x T.F.	1	4.166	4.166	1.75	0.19
Imp x Val x Gend	1	18.537	18.537	7.78	0.008
Error (Imp x Val)	39	92.956	2.383		
Nov x Imp x Val	1	0.670	0.670	0.24	0.63
Nov x Imp x Val x T.F.	1	7.639	7.639	2.72	0.11
Nov x Imp x Val x Gend	1	0.101	0.101	0.04	0.85
Error (Nov x Imp x Val)	39	109.407	2.805		

Table 15
Summary of Mixed Factorial Analysis of
Variance for Memory Pleasantness
(Data Based on Combined Rating-Ranking Index)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.576	0.576	1.40	0.24
Gend	1	1.026	1.026	2.50	0.12
Error	39	27.154	0.696		
Nov	1	16.226	16.226	7.15	0.01
Nov x T.F.	1	2.307	2.307	1.02	0.32
Nov x Gend	1	0.086	0.086	0.04	0.85
Error (Nov)	39	88.506	2.269		
Imp	1	0.048	0.048	0.01	0.91
Imp x T.F.	1	0.057	0.057	0.02	0.90
Imp x Gend	1	1.122	1.122	0.32	0.58
Error (Imp)	39	138.431	3.549		
Val	1	296.899	296.899	91.85	0.0001
Val x T.F.	1	5.501	5.501	1.70	0.20
Val x Gend	1	1.257	1.257	0.39	0.54
Error (Val)	39	126.071	3.233		
Nov x Imp	1	2.212	2.212	1.17	0.29
Nov x Imp x T.F.	1	1.053	1.053	0.56	0.46
Nov x Imp x Gend	1	0.437	0.437	0.23	0.63
Error (Nov x Imp)	39	73.848	1.894		
Nov x Val	1	2.967	2.967	2.82	0.10
Nov x Val x T.F.	1	4.286	4.286	4.07	0.05
Nov x Val x Gend	1	0.077	0.077	0.07	0.79
Error (Nov x Val)	39	41.027	1.052		
Imp x Val	1	4.625	4.625	1.88	0.18
Imp x Val x T.F.	1	3.945	3.945	1.60	0.21
Imp x Val x Gend	1	1.481	1.481	0.60	0.44
Error (Imp x Val)	39	95.971	2.461		
Nov x Imp x Val	1	1.501	1.501	0.85	0.36
Nov x Imp x Val x T.F.	1	3.308	3.308	1.86	0.18
Nov x Imp x Val x Gend	1	0.680	0.680	0.38	0.54
Error (Nov x Imp x Val)	39	69.190	1.774		

Table 16
Summary of Mixed Factorial Analysis of
Variance for Event Significance
(Data Based on Combined Rating-Ranking Index)

Key: T.F. = Test Format Nov = Novelty
Gend = Gender Imp = Personal Importance
Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	2.113	2.113	1.71	0.20
Gend	1	9.012	9.012	7.29	0.01
Error	39	48.186	1.236		
Nov	1	57.460	57.460	15.46	0.0003
Nov x T.F.	1	8.202	8.202	2.21	0.15
Nov x Gend	1	0.002	0.002	0.00	0.98
Error (Nov)	39	144.965	3.717		
Imp	1	0.018	0.018	0.00	0.95
Imp x T.F.	1	7.619	7.619	1.99	0.17
Imp x Gend	1	0.563	0.563	0.15	0.70
Error (Imp)	39	149.557	3.835		
Val	1	0.000	0.000	0.00	1.00
Val x T.F.	1	0.614	0.614	0.15	0.70
Val x Gend	1	4.476	4.476	1.07	0.31
Error (Val)	39	163.449	4.191		
Nov x Imp	1	5.440	5.440	2.59	0.12
Nov x Imp x T.F.	1	7.813	7.813	3.72	0.06
Nov x Imp x Gend	1	13.599	13.599	6.48	0.02
Error (Nov x Imp)	39	81.849	2.099		
Nov x Val	1	2.086	2.086	1.10	0.30
Nov x Val x T.F.	1	1.096	1.096	0.58	0.45
Nov x Val x Gend	1	0.706	0.706	0.37	0.55
Error (Nov x Val)	39	74.089	1.900		
Imp x Val	1	5.898	5.898	4.55	0.04
Imp x Val x T.F.	1	0.289	0.289	0.22	0.64
Imp x Val x Gend	1	0.244	0.244	0.19	0.67
Error (Imp x Val)	39	50.509	1.295		
Nov x Imp x Val	1	1.635	1.635	0.65	0.42
Nov x Imp x Val x T.F.	1	5.126	5.126	2.04	0.16
Nov x Imp x Val x Gend	1	0.010	0.010	0.00	0.95
Error (Nov x Imp x Val)	39	98.047	2.514		

Table 17
Summary of Mixed Factorial Analysis of
Variance for Frequency of Rehearsal
 (Data Based on Combined Rating-Ranking Index)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.009	0.009	0.01	0.94
Gend	1	8.911	8.911	5.81	0.02
Error	39	59.831	1.534		
Nov	1	3.496	3.496	0.91	0.35
Nov x T.F.	1	1.480	1.480	0.38	0.54
Nov x Gend	1	3.270	3.270	0.85	0.36
Error (Nov)	39	150.117	3.849		
Imp	1	3.202	3.202	1.04	0.31
Imp x T.F.	1	0.000	0.000	0.00	0.99
Imp x Gend	1	6.082	6.082	1.98	0.17
Error (Imp)	39	119.941	3.075		
Val	1	0.134	0.134	0.07	0.79
Val x T.F.	1	0.164	0.164	0.09	0.77
Val x Gend	1	0.498	0.498	0.26	0.61
Error (Val)	39	75.056	1.925		
Nov x Imp	1	14.163	14.163	5.76	0.02
Nov x Imp x T.F.	1	1.242	1.242	0.51	0.48
Nov x Imp x Gend	1	12.495	12.495	5.08	0.03
Error (Nov x Imp)	39	95.837	2.457		
Nov x Val	1	0.375	0.375	0.20	0.66
Nov x Val x T.F.	1	1.068	1.068	0.57	0.46
Nov x Val x Gend	1	4.654	4.654	2.47	0.12
Error (Nov x Val)	39	73.494	1.884		
Imp x Val	1	16.813	16.813	8.52	0.006
Imp x Val x T.F.	1	3.280	3.280	1.66	0.20
Imp x Val x Gend	1	0.065	0.065	0.03	0.86
Error (Imp x Val)	39	76.955	1.973		
Nov x Imp x Val	1	1.614	1.614	1.03	0.32
Nov x Imp x Val x T.F.	1	4.879	4.879	3.11	0.09
Nov x Imp x Val x Gend	1	0.011	0.011	0.01	0.93
Error (Nov x Imp x Val)	39	61.106	1.567		

Table 18
Summary of Mixed Factorial Analysis of
Variance for Event Complexity
(Data Based on Combined Rating-Ranking Index)

Key: T.F. = Test Format Nov = Novelty
Gend = Gender Imp = Personal Importance
Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.163	0.163	0.09	0.77
Gend	1	0.411	0.411	0.22	0.64
Error	39	74.107	1.900		
Nov	1	11.485	11.485	3.40	0.07
Nov x T.F.	1	2.960	2.960	0.88	0.36
Nov x Gend	1	0.498	0.498	0.15	0.70
Error (Nov)	39	131.822	3.380		
Imp	1	0.683	0.683	0.17	0.68
Imp x T.F.	1	1.313	1.313	0.32	0.57
Imp x Gend	1	0.932	0.932	0.23	0.64
Error (Imp)	39	158.867	4.074		
Val	1	6.228	6.228	1.98	0.17
Val x T.F.	1	0.005	0.005	0.00	0.97
Val x Gend	1	16.109	16.109	5.13	0.03
Error (Val)	39	122.430	3.139		
Nov x Imp	1	8.206	8.206	4.25	0.05
Nov x Imp x T.F.	1	0.095	0.095	0.05	0.83
Nov x Imp x Gend	1	11.849	11.849	6.14	0.02
Error (Nov x Imp)	39	75.291	1.931		
Nov x Val	1	0.953	0.953	0.66	0.42
Nov x Val x T.F.	1	4.288	4.288	2.95	0.09
Nov x Val x Gend	1	1.206	1.206	0.83	0.37
Error (Nov x Val)	39	56.746	1.455		
Imp x Val	1	7.458	7.458	3.76	0.06
Imp x Val x T.F.	1	2.025	2.025	1.02	0.32
Imp x Val x Gend	1	4.775	4.775	2.41	0.13
Error (Imp x Val)	39	77.295	1.982		
Nov x Imp x Val	1	3.971	3.971	1.93	0.17
Nov x Imp x Val x T.F.	1	14.020	14.020	6.82	0.01
Nov x Imp x Val x Gend	1	6.835	6.835	3.32	0.08
Error (Nov x Imp x Val)	39	80.193	2.056		

Table 19
Summary of Mixed Factorial Analysis of Variance
for Memory Self-Descriptiveness
 (Data Based on Rankings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.075	0.075	0.77	0.39
Gend	1	0.082	0.082	0.84	0.37
Error	31	3.035	0.098		
Nov	1	53.097	53.097	9.73	0.004
Nov x T.F.	1	23.612	23.612	4.33	0.05
Nov x Gend	1	30.777	30.777	5.64	0.02
Error (Nov)	31	169.153	5.457		
Imp	1	8.014	8.014	2.08	0.16
Imp x T.F.	1	0.012	0.012	0.00	0.96
Imp x Gend	1	3.058	3.058	0.79	0.38
Error (Imp)	31	119.677	3.861		
Val	1	13.898	13.898	1.93	0.17
Val x T.F.	1	1.658	1.658	0.23	0.63
Val x Gend	1	21.173	21.173	2.94	0.10
Error (Val)	31	222.882	7.190		
Nov x Imp	1	6.510	6.510	1.32	0.26
Nov x Imp x T.F.	1	4.123	4.123	0.84	0.37
Nov x Imp x Gend	1	0.160	0.160	0.03	0.86
Error (Nov x Imp)	31	152.769	4.928		
Nov x Val	1	4.391	4.391	0.62	0.44
Nov x Val x T.F.	1	1.071	1.071	0.15	0.70
Nov x Val x Gend	1	9.613	9.613	1.35	0.25
Error (Nov x Val)	31	220.976	7.128		
Imp x Val	1	31.475	31.475	7.96	0.008
Imp x Val x T.F.	1	0.007	0.007	0.00	0.97
Imp x Val x Gend	1	2.615	2.615	0.66	0.42
Error (Imp x Val)	31	122.628	3.956		
Nov x Imp x Val	1	3.352	3.352	0.60	0.44
Nov x Imp x Val x T.F.	1	15.557	15.557	2.80	0.10
Nov x Imp x Val x Gend	1	0.241	0.241	0.04	0.84
Error (Nov x Imp x Val)	31	172.516	5.565		

Table 20
Summary of Mixed Factorial Analysis of
Variance for Event Novelty
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	1.606	1.606	0.32	0.57
Gend	1	1.368	1.368	0.27	0.60
Error	41	204.327	4.984		
Nov	1	195.390	195.390	64.79	0.0001
Nov x T.F.	1	1.490	1.490	0.48	0.49
Nov x Gend	1	1.190	1.190	0.39	0.53
Error (Nov)	41	123.641	3.016		
Imp	1	2.792	2.792	1.19	0.28
Imp x T.F.	1	5.006	5.006	2.14	0.15
Imp x Gend	1	0.154	0.154	0.07	0.80
Error (Imp)	41	95.990	2.341		
Val	1	1.208	1.208	0.89	0.35
Val x T.F.	1	0.590	0.590	0.44	0.51
Val x Gend	1	0.033	0.033	0.02	0.88
Error (Val)	41	55.453	1.353		
Nov x Imp	1	0.165	0.165	0.08	0.78
Nov x Imp x T.F.	1	1.991	1.991	0.98	0.33
Nov x Imp x Gend	1	0.457	0.457	0.23	0.64
Error (Nov x Imp)	41	83.182	2.029		
Nov x Val	1	0.025	0.025	0.02	0.90
Nov x Val x T.F.	1	2.423	2.423	1.60	0.21
Nov x Val x Gend	1	0.063	0.063	0.04	0.84
Error (Nov x Val)	41	62.157	1.516		
Imp x Val	1	1.936	1.936	1.33	0.25
Imp x Val x T.F.	1	1.088	1.088	0.75	0.39
Imp x Val x Gend	1	0.007	0.007	0.00	0.95
Error (Imp x Val)	41	59.534	1.452		
Nov x Imp x Val	1	1.222	1.222	0.76	0.39
Nov x Imp x Val x T.F.	1	0.060	0.060	0.04	0.85
Nov x Imp x Val x Gend	1	6.358	6.358	3.95	0.05
Error (Nov x Imp x Val)	41	66.012	1.610		

Table 21
Summary of Mixed Factorial Analysis of
Variance for Confidence of Recall
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.681	0.681	0.27	0.61
Gend	1	6.731	6.731	2.68	0.11
Error	41	102.944	2.511		
Nov	1	0.536	0.536	0.29	0.59
Nov x T.F.	1	0.153	0.153	0.08	0.77
Nov x Gend	1	1.139	1.139	0.63	0.43
Error (Nov)	41	74.727	1.822		
Imp	1	0.000	0.000	0.00	0.98
Imp x T.F.	1	1.350	1.350	1.23	0.27
Imp x Gend	1	4.646	4.646	4.25	0.04
Error (Imp)	41	44.849	1.094		
Val	1	0.418	0.418	0.32	0.58
Val x T.F.	1	0.048	0.048	0.04	0.85
Val x Gend	1	0.012	0.012	0.01	0.92
Error (Val)	41	54.277	1.324		
Nov x Imp	1	1.069	1.069	1.09	0.30
Nov x Imp x T.F.	1	0.014	0.014	0.01	0.91
Nov x Imp x Gend	1	0.019	0.019	0.02	0.89
Error (Nov x Imp)	41	40.078	0.978		
Nov x Val	1	5.167	5.167	4.68	0.04
Nov x Val x T.F.	1	4.545	4.545	4.11	0.05
Nov x Val x Gend	1	0.882	0.882	0.80	0.38
Error (Nov x Val)	41	45.301	1.105		
Imp x Val	1	0.300	0.300	0.35	0.56
Imp x Val x T.F.	1	2.368	2.368	2.77	0.10
Imp x Val x Gend	1	15.146	15.146	17.70	0.0001
Error (Imp x Val)	41	35.092	0.856		
Nov x Imp x Val	1	0.406	0.406	0.30	0.59
Nov x Imp x Val x T.F.	1	0.411	0.411	0.30	0.58
Nov x Imp x Val x Gend	1	0.328	0.328	0.24	0.63
Error (Nov x Imp x Val)	41	56.333	1.374		

Table 22
Summary of Mixed Factorial Analysis of
Variance for Event Impact
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	2.600	2.600	0.53	0.47
Gend	1	20.910	20.910	4.27	0.04
Error	41	200.922	4.901		
Nov	1	33.596	33.596	17.50	0.0001
Nov x T.F.	1	6.842	6.842	3.56	0.07
Nov x Gend	1	2.501	2.501	1.30	0.260
Error (Nov)	41	78.694	1.919		
Imp	1	0.156	0.156	0.04	0.85
Imp x T.F.	1	8.766	8.766	2.13	0.15
Imp x Gend	1	1.278	1.278	0.31	0.58
Error (Imp)	41	168.654	4.114		
Val	1	4.050	4.050	1.43	0.24
Val x T.F.	1	0.350	0.350	0.12	0.73
Val x Gend	1	2.533	2.533	0.90	0.35
Error (Val)	41	115.861	2.826		
Nov x Imp	1	0.986	0.986	0.60	0.44
Nov x Imp x T.F.	1	3.242	3.242	1.97	0.17
Nov x Imp x Gend	1	5.171	5.171	3.15	0.08
Error (Nov x Imp)	41	67.373	1.643		
Nov x Val	1	5.052	5.052	2.37	0.13
Nov x Val x T.F.	1	0.046	0.046	0.02	0.88
Nov x Val x Gend	1	1.433	1.433	0.67	0.42
Error (Nov x Val)	41	87.577	2.136		
Imp x Val	1	4.416	4.416	1.46	0.23
Imp x Val x T.F.	1	0.123	0.123	0.04	0.84
Imp x Val x Gend	1	1.134	1.134	0.37	0.54
Error (Imp x Val)	41	124.236	3.030		
Nov x Imp x Val	1	5.400	5.400	2.28	0.14
Nov x Imp x Val x T.F.	1	5.697	5.697	2.41	0.13
Nov x Imp x Val x Gend	1	0.347	0.347	0.15	0.70
Error (Nov x Imp x Val)	41	97.023	2.366		

Table 23
Summary of Mixed Factorial Analysis of
Variance for Perceived Control
(Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
Gend = Gender Imp = Personal Importance
Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.011	0.011	0.00	0.96
Gend	1	4.323	4.323	0.86	0.36
Error	40	201.177	5.029		
Nov	1	0.372	0.372	0.11	0.74
Nov x T.F.	1	0.040	0.040	0.01	0.91
Nov x Gend	1	9.108	9.108	2.71	0.11
Error (Nov)	40	134.614	3.365		
Imp	1	2.468	2.468	0.74	0.39
Imp x T.F.	1	2.292	2.292	0.69	0.41
Imp x Gend	1	1.988	1.988	0.60	0.44
Error (Imp)	40	132.521	3.313		
Val	1	127.500	127.500	48.80	0.0001
Val x T.F.	1	4.214	4.214	1.61	0.21
Val x Gend	1	1.758	1.758	0.67	0.42
Error (Val)	40	104.501	2.613		
Nov x Imp	1	0.213	0.213	0.08	0.78
Nov x Imp x T.F.	1	1.122	1.122	0.41	0.53
Nov x Imp x Gend	1	1.257	1.257	0.46	0.50
Error (Nov x Imp)	40	110.132	2.753		
Nov x Val	1	0.468	0.468	0.18	0.67
Nov x Val x T.F.	1	0.549	0.549	0.21	0.65
Nov x Val x Gend	1	7.213	7.213	2.77	0.10
Error (Nov x Val)	40	104.339	2.608		
Imp x Val	1	1.533	1.533	0.37	0.54
Imp x Val x T.F.	1	7.348	7.348	1.79	0.19
Imp x Val x Gend	1	0.090	0.090	0.02	0.88
Error (Imp x Val)	40	164.040	4.100		
Nov x Imp x Val	1	0.058	0.058	0.02	0.89
Nov x Imp x Val x T.F.	1	2.066	2.066	0.64	0.43
Nov x Imp x Val x Gend	1	2.477	2.477	0.77	0.39
Error (Nov x Imp x Val)	40	128.515	3.213		

Table 24
Summary of Mixed Factorial Analysis of
Variance for Event Desirability
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.725	0.725	0.42	0.52
Gend	1	2.622	2.622	1.53	0.22
Error	41	70.240	1.713		
Nov	1	0.064	0.064	0.04	0.85
Nov x T.F.	1	1.926	1.926	1.07	0.31
Nov x Gend	1	0.253	0.253	0.14	0.71
Error (Nov)	41	73.692	1.797		
Imp	1	0.744	0.744	0.23	0.63
Imp x T.F.	1	0.396	0.396	0.12	0.73
Imp x Gend	1	5.686	5.686	1.77	0.19
Error (Imp)	41	131.953	3.218		
Val	1	305.907	305.907	125.13	0.0001
Val x T.F.	1	17.334	17.334	7.09	0.01
Val x Gend	1	2.273	2.273	0.93	0.34
Error (Val)	41	100.232	2.445		
Nov x Imp	1	1.870	1.870	1.69	0.20
Nov x Imp x T.F.	1	0.200	0.200	0.18	0.67
Nov x Imp x Gend	1	0.168	0.168	0.15	0.70
Error (Nov x Imp)	41	45.392	1.107		
Nov x Val	1	0.633	0.633	0.45	0.51
Nov x Val x T.F.	1	0.159	0.159	0.11	0.74
Nov x Val x Gend	1	0.451	0.451	0.32	0.58
Error (Nov x Val)	41	58.334	1.423		
Imp x Val	1	0.307	0.307	0.09	0.77
Imp x Val x T.F.	1	3.599	3.599	1.03	0.32
Imp x Val x Gend	1	2.051	2.051	0.59	0.45
Error (Imp x Val)	41	143.587	3.502		
Nov x Imp x Val	1	3.898	3.898	2.40	0.13
Nov x Imp x Val x T.F.	1	1.513	1.513	0.93	0.34
Nov x Imp x Val x Gend	1	3.449	3.449	2.12	0.15
Error (Nov x Imp x Val)	41	66.579	1.624		

Table 25
Summary of Mixed Factorial Analysis of
Variance for Expectancy
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	1.918	1.918	0.38	0.54
Gend	1	0.443	0.443	0.09	0.77
Error	41	206.465	5.036		
Nov	1	21.602	21.602	5.07	0.03
Nov x T.F.	1	4.522	4.522	1.06	0.31
Nov x Gend	1	1.389	1.389	0.33	0.57
Error (Nov)	41	174.842	4.264		
Imp	1	0.003	0.003	0.00	0.98
Imp x T.F.	1	1.337	1.337	0.26	0.61
Imp x Gend	1	3.825	3.825	0.75	0.39
Error (Imp)	41	209.733	5.115		
Val	1	21.898	21.898	7.43	0.009
Val x T.F.	1	0.036	0.036	0.01	0.91
Val x Gend	1	13.775	13.775	4.68	0.04
Error (Val)	41	120.787	2.946		
Nov x Imp	1	1.680	1.680	0.69	0.41
Nov x Imp x T.F.	1	7.742	7.742	3.16	0.08
Nov x Imp x Gend	1	0.069	0.069	0.03	0.87
Error (Nov x Imp)	41	100.508	2.451		
Nov x Val	1	1.664	1.664	0.84	0.37
Nov x Val x T.F.	1	13.357	13.357	6.73	0.01
Nov x Val x Gend	1	0.500	0.500	0.25	0.62
Error (Nov x Val)	41	81.389	1.985		
Imp x Val	1	0.010	0.010	0.01	0.94
Imp x Val x T.F.	1	0.022	0.022	0.01	0.91
Imp x Val x Gend	1	0.913	0.913	0.49	0.49
Error (Imp x Val)	41	76.290	1.861		
Nov x Imp x Val	1	0.242	0.242	0.11	0.74
Nov x Imp x Val x T.F.	1	7.377	7.377	3.47	0.07
Nov x Imp x Val x Gend	1	0.133	0.133	0.06	0.80
Error (Nov x Imp x Val)	41	87.136	2.125		

Table 26
Summary of Mixed Factorial Analysis of
Variance for Age-Relatedness
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	9.452	9.452	1.01	0.32
Gend	1	17.031	17.031	1.81	0.19
Error	41	385.363	9.399		
Nov	1	66.971	66.971	29.93	0.0001
Nov x T.F.	1	12.824	12.824	5.73	0.02
Nov x Gend	1	1.927	1.927	0.86	0.36
Error (Nov)	41	91.755	2.238		
Imp	1	2.035	2.035	0.53	0.47
Imp x T.F.	1	3.354	3.354	0.87	0.36
Imp x Gend	1	1.242	1.242	0.32	0.57
Error (Imp)	41	157.729	3.847		
Val	1	5.305	5.305	1.96	0.17
Val x T.F.	1	0.403	0.403	0.15	0.70
Val x Gend	1	1.153	1.153	0.43	0.52
Error (Val)	41	110.959	2.706		
Nov x Imp	1	5.437	5.437	1.07	0.31
Nov x Imp x T.F.	1	3.602	3.602	0.71	0.40
Nov x Imp x Gend	1	13.122	13.122	2.59	0.12
Error (Nov x Imp)	41	207.671	5.065		
Nov x Val	1	2.604	2.604	1.19	0.28
Nov x Val x T.F.	1	14.265	14.265	6.52	0.01
Nov x Val x Gend	1	1.114	1.114	0.51	0.48
Error (Nov x Val)	41	89.718	2.188		
Imp x Val	1	0.548	0.548	0.17	0.68
Imp x Val x T.F.	1	0.524	0.524	0.17	0.69
Imp x Val x Gend	1	0.086	0.086	0.03	0.87
Error (Imp x Val)	41	128.948	3.145		
Nov x Imp x Val	1	0.027	0.027	0.01	0.93
Nov x Imp x Val x T.F.	1	1.069	1.069	0.27	0.61
Nov x Imp x Val x Gend	1	0.052	0.052	0.01	0.91
Error (Nov x Imp x Val)	41	164.280	4.006		

Table 27
Summary of Mixed Factorial Analysis of
Variance for Event Likelihood
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.123	0.123	0.02	0.89
Gend	1	0.191	0.191	0.03	0.87
Error	41	271.760	6.628		
Nov	1	102.831	102.831	41.10	0.0001
Nov x T.F.	1	0.000	0.000	0.00	1.00
Nov x Gend	1	0.295	0.295	0.12	0.73
Error (Nov)	41	102.575	2.502		
Imp	1	0.646	0.646	0.26	0.61
Imp x T.F.	1	30.119	30.119	12.04	0.001
Imp x Gend	1	1.925	1.925	0.77	0.39
Error (Imp)	41	102.580	2.502		
Val	1	19.867	19.867	10.67	0.002
Val x T.F.	1	0.328	0.328	0.18	0.68
Val x Gend	1	3.752	3.752	2.01	0.16
Error (Val)	41	76.360	1.862		
Nov x Imp	1	0.020	0.020	0.00	0.95
Nov x Imp x T.F.	1	4.268	4.268	0.93	0.34
Nov x Imp x Gend	1	1.394	1.394	0.30	0.59
Error (Nov x Imp)	41	188.807	4.605		
Nov x Val	1	1.160	1.160	0.61	0.44
Nov x Val x T.F.	1	5.149	5.149	2.70	0.11
Nov x Val x Gend	1	0.529	0.529	0.28	0.60
Error (Nov x Val)	41	78.314	78.314		
Imp x Val	1	8.994	8.994	2.32	0.14
Imp x Val x T.F.	1	1.126	1.126	0.29	0.59
Imp x Val x Gend	1	6.381	6.381	1.64	0.21
Error (Imp x Val)	41	159.096	3.880		
Nov x Imp x Val	1	1.194	1.194	0.31	0.58
Nov x Imp x Val x T.F.	1	0.000	0.000	0.00	0.99
Nov x Imp x Val x Gend	1	14.436	14.436	3.76	0.06
Error (Nov x Imp x Val)	41	157.395	3.839		

Table 28
Summary of Mixed Factorial Analysis of Variance for Relative
Focus on Intentions Versus Outcomes
(Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
Gend = Gender Imp = Personal Importance
Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.034	0.034	0.01	0.92
Gend	1	0.152	0.152	0.04	0.84
Error	39	138.445	3.550		
Nov	1	1.158	1.158	0.48	0.49
Nov x T.F.	1	0.014	0.014	0.01	0.94
Nov x Gend	1	3.764	3.764	1.56	0.22
Error (Nov)	39	93.938	2.409		
Imp	1	0.931	0.931	0.24	0.63
Imp x T.F.	1	9.498	9.498	2.41	0.13
Imp x Gend	1	3.415	3.415	0.87	0.36
Error (Imp)	39	153.870	3.945		
Val	1	0.455	0.455	0.11	0.74
Val x T.F.	1	0.923	0.923	0.22	0.64
Val x Gend	1	1.201	1.201	0.29	0.59
Error (Val)	39	160.841	4.124		
Nov x Imp	1	1.437	1.437	0.53	0.47
Nov x Imp x T.F.	1	6.617	6.617	2.42	0.13
Nov x Imp x Gend	1	0.263	0.263	0.10	0.76
Error (Nov x Imp)	39	106.668	2.735		
Nov x Val	1	5.830	5.830	2.42	0.13
Nov x Val x T.F.	1	0.503	0.503	0.21	0.65
Nov x Val x Gend	1	8.829	8.829	3.66	0.06
Error (Nov x Val)	39	94.039	2.411		
Imp x Val	1	5.564	5.564	1.61	0.21
Imp x Val x T.F.	1	1.934	1.934	0.56	0.46
Imp x Val x Gend	1	2.871	2.871	0.83	0.37
Error (Imp x Val)	39	134.446	3.447		
Nov x Imp x Val	1	0.016	0.016	0.00	0.95
Nov x Imp x Val x T.F.	1	2.144	2.144	0.47	0.50
Nov x Imp x Val x Gend	1	0.033	0.033	0.01	0.93
Error (Nov x Imp x Val)	39	178.898	4.587		

Table 29
Summary of Mixed Factorial Analysis of Variance
for Intention - Outcome Match
 (Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.383	0.383	0.07	0.79
Gend	1	13.716	13.716	2.59	0.12
Error	39	206.605	5.298		
Nov	1	0.542	0.542	0.38	0.54
Nov x T.F.	1	0.630	0.630	0.45	0.51
Nov x Gend	1	0.630	0.630	0.45	0.51
Error (Nov)	39	55.108	1.413		
Imp	1	0.718	0.718	0.23	0.64
Imp x T.F.	1	4.467	4.467	1.40	0.24
Imp x Gend	1	7.967	7.967	2.50	0.12
Error (Imp)	39	124.341	3.188		
Val	1	233.105	233.105	87.08	0.0001
Val x T.F.	1	0.715	0.715	0.27	0.61
Val x Gend	1	0.410	0.410	0.15	0.70
Error (Val)	39	104.398	2.677		
Nov x Imp	1	0.299	0.299	0.12	0.73
Nov x Imp x T.F.	1	5.167	5.167	2.05	0.16
Nov x Imp x Gend	1	0.695	0.695	0.28	0.60
Error (Nov x Imp)	39	98.113	2.516		
Nov x Val	1	0.878	0.878	0.37	0.55
Nov x Val x T.F.	1	0.246	0.246	0.10	0.75
Nov x Val x Gend	1	0.107	0.107	0.04	0.83
Error (Nov x Val)	39	92.909	2.382		
Imp x Val	1	1.505	1.505	0.61	0.44
Imp x Val x T.F.	1	1.474	1.474	0.60	0.44
Imp x Val x Gend	1	0.710	0.710	0.29	0.59
Error (Imp x Val)	39	95.472	2.448		
Nov x Imp x Val	1	2.836	2.836	1.02	0.32
Nov x Imp x Val x T.F.	1	0.284	0.284	0.10	0.75
Nov x Imp x Val x Gend	1	2.436	2.436	0.88	0.35
Error (Nov x Imp x Val)	39	108.121	2.772		

Table 30
Summary of Mixed Factorial Analysis of Variance
for Good Versus Bad Intentions
(Data Based on Ratings)

Key: T.F. = Test Format Nov = Novelty
Gend = Gender Imp = Personal Importance
Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.117	0.117	0.04	0.84
Gend	1	3.950	3.950	1.35	0.25
Error	39	114.308	2.931		
Nov	1	1.959	1.959	1.58	0.22
Nov x T.F.	1	0.274	0.274	0.22	0.64
Nov x Gend	1	0.274	0.274	0.22	0.64
Error (Nov)	39	48.360	1.240		
Imp	1	0.204	0.204	0.11	0.74
Imp x T.F.	1	1.054	1.054	0.59	0.45
Imp x Gend	1	0.679	0.679	0.38	0.54
Error (Imp)	39	69.274	1.776		
Val	1	76.743	76.743	32.44	0.0001
Val x T.F.	1	5.237	5.237	2.21	0.14
Val x Gend	1	1.112	1.112	0.47	0.50
Error (Val)	39	92.258	2.366		
Nov x Imp	1	4.326	4.326	2.23	0.14
Nov x Imp x T.F.	1	0.307	0.307	0.16	0.69
Nov x Imp x Gend	1	1.682	1.682	0.87	0.36
Error (Nov x Imp)	39	75.702	1.941		
Nov x Val	1	1.358	1.358	1.51	0.23
Nov x Val x T.F.	1	0.181	0.181	0.20	0.66
Nov x Val x Gend	1	0.000	0.000	0.00	0.99
Error (Nov x Val)	39	35.120	0.901		
Imp x Val	1	2.250	2.250	1.53	0.22
Imp x Val x T.F.	1	0.790	0.790	0.54	0.47
Imp x Val x Gend	1	0.304	0.304	0.21	0.65
Error (Imp x Val)	39	57.205	1.467		
Nov x Imp x Val	1	0.397	0.397	0.46	0.50
Nov x Imp x Val x T.F.	1	2.887	2.887	3.35	0.07
Nov x Imp x Val x Gend	1	0.067	0.067	0.08	0.78
Error (Nov x Imp x Val)	39	33.608	0.862		

Table 31
Summary of Mixed Factorial Analysis of
Variance for Memory Dating

Key: T.F. = Test Format Nov = Novelty
 Gend = Gender Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
T.F.	1	0.729	0.729	0.05	0.83
Gend	1	6.607	6.607	0.43	0.51
Error	37	562.664	15.207		
Nov	1	235.792	235.792	31.68	0.0001
Nov x T.F.	1	12.286	12.286	1.65	0.21
Nov x Gend	1	0.681	0.681	0.09	0.76
Error (Nov)	37	275.394	7.443		
Imp	1	0.543	0.543	0.11	0.74
Imp x T.F.	1	3.968	3.968	0.81	0.37
Imp x Gend	1	15.330	15.330	3.15	0.08
Error (Imp)	37	180.193	4.870		
Val	1	0.035	0.035	0.01	0.92
Val x T.F.	1	1.248	1.248	0.33	0.57
Val x Gend	1	17.065	17.065	4.46	0.04
Error (Val)	37	141.542	3.825		
Nov x Imp	1	0.093	0.093	0.03	0.86
Nov x Imp x T.F.	1	1.310	1.310	0.47	0.50
Nov x Imp x Gend	1	9.184	9.184	3.31	0.08
Error (Nov x Imp)	37	102.689	2.775		
Nov x Val	1	7.587	7.587	2.24	0.14
Nov x Val x T.F.	1	1.097	1.097	0.32	0.57
Nov x Val x Gend	1	6.854	6.854	2.03	0.16
Error (Nov x Val)	37	125.157	3.383		
Imp x Val	1	9.666	9.666	2.56	0.12
Imp x Val x T.F.	1	0.014	0.014	0.00	0.95
Imp x Val x Gend	1	8.868	8.868	2.35	0.13
Error (Imp x Val)	37	139.875	3.780		
Nov x Imp x Val	1	8.963	8.963	2.47	0.12
Nov x Imp x Val x T.F.	1	0.682	0.682	0.19	0.67
Nov x Imp x Val x Gend	1	0.023	0.023	0.01	0.94
Error (Nov x Imp x Val)	37	134.439	3.633		

Table 32
Summary of Mixed Factorial Analysis of
Variance for Recall Latency

Key:
 Gend = Gender

Nov = Novelty
 Imp = Personal Importance
 Val = Valence

Source	Df	SS	MS	F	p
Gend	1	1.570	1.570	0.75	0.40
Error	24	50.236	2.093		
Nov	1	9.898	9.898	7.76	0.01
Nov x Gend	1	0.002	0.002	0.00	0.97
Error (Nov)	24	30.594	1.275		
Imp	1	0.628	0.628	0.64	0.43
Imp x Gend	1	2.617	2.617	2.69	0.11
Error (Imp)	24	23.385	0.974		
Val	1	0.609	0.609	0.74	0.40
Val x Gend	1	0.802	0.802	0.98	0.33
Error (Val)	24	19.729	0.822		
Nov x Imp	1	0.713	0.713	1.85	0.19
Nov x Imp x Gend	1	0.006	0.006	0.02	0.90
Error (Nov x Imp)	24	9.233	0.385		
Nov x Val	1	0.084	0.084	0.17	0.68
Nov x Val x Gend	1	0.001	0.001	0.00	0.96
Error (Nov x Val)	24	11.740	0.489		
Imp x Val	1	0.516	0.516	1.11	0.30
Imp x Val x Gend	1	0.044	0.044	0.10	0.76
Error (Imp x Val)	24	11.145	0.464		
Nov x Imp x Val	1	0.008	0.008	0.01	0.92
Nov x Imp x Val x Gend	1	0.018	0.018	0.02	0.88
Error (Nov x Imp x Val)	24	19.719	0.822		

Table 33
Summary of Mixed Factorial Analysis of Variance for Estimates
of Frequency of Weekly Encounter with Domain Words

Key: Gend = Gender

Imp = Personal Importance

Val = Valence

Source	Df	SS	MS	F	p
Gend	1	0.004	0.004	1.06	0.31
Error	66	0.242	0.004		
Imp	1	16.736	16.736	8.65	0.005
Imp x Gend	1	1.060	1.060	0.55	0.46
Error (Imp)	66	127.687	1.935		
Val	1	48.838	48.838	39.68	0.0001
Val x Gend	1	0.397	0.397	0.32	0.57
Error (Val)	66	81.232	1.231		
Imp x Val	1	5.175	5.175	6.10	0.02
Imp x Val x Gend	1	1.204	1.204	1.42	0.24
Error (Imp x Val)	66	56.013	0.849		

Table 34
Summary of Mixed Factorial Analysis of Variance for Estimates
of Frequency of Use of Domain Words in Self-Description

Key: Gend = Gender

Imp = Personal Importance

Val = Valence

Source	Df	SS	MS	F	p
Gend	1	0.016	0.016	1.06	0.31
Error	66	0.970	0.015		
Imp	1	0.039	0.039	0.03	0.87
Imp x Gend	1	6.509	6.509	4.45	0.04
Error (Imp)	66	96.476	1.462		
Val	1	58.582	58.582	46.99	0.0001
Val x Gend	1	0.347	0.347	0.28	0.60
Error (Val)	66	82.286	1.247		
Imp x Val	1	3.273	3.273	2.31	0.13
Imp x Val x Gend	1	0.096	0.096	0.07	0.80
Error (Imp x Val)	66	93.595	1.418		

Table 35
Summary of Mixed Factorial Analysis of Variance for Estimates of
Frequency of Use of Domain Words in Descriptions of Others

Key: Gend = Gender

Imp = Personal Importance

Val = Valence

Source	Df	SS	MS	F	p
Gend	1	0.000	0.000	0.00	1.00
Error	66	0.000	0.000		
Imp	1	2.741	2.741	1.54	0.22
Imp x Gend	1	1.977	1.977	1.11	0.30
Error (Imp)	66	117.141	1.775		
Val	1	18.243	18.243	9.87	0.003
Val x Gend	1	0.949	0.949	0.51	0.48
Error (Val)	66	122.036	1.849		
Imp x Val	1	0.355	0.355	0.31	0.58
Imp x Val x Gend	1	0.120	0.120	0.10	0.75
Error (Imp x Val)	66	76.513	1.159		

Table 36
Summary of Mixed Factorial Analysis of Variance for Estimates of
Frequency of Description by Mother in Terms of Domain Words

Key: Gend = Gender

Imp = Personal Importance

Val = Valence

Source	Df	SS	MS	F	p
Gend	1	0.000	0.000	0.00	1.00
Error	66	0.000	0.000		
Imp	1	1.696	1.696	1.64	0.20
Imp x Gend	1	1.108	1.108	1.07	0.30
Error (Imp)	66	68.113	1.032		
Val	1	86.934	86.934	77.85	0.0001
Val x Gend	1	0.110	0.110	0.10	0.75
Error (Val)	66	73.699	1.117		
Imp x Val	1	18.951	18.951	14.08	0.0004
Imp x Val x Gend	1	0.127	0.127	0.09	0.76
Error (Imp x Val)	66	88.814	1.346		

Table 37
Summary of Mixed Factorial Analysis of Variance for Estimates of
Frequency of Description by Father in Terms of Domain Words

Key: Gend = Gender

Imp = Personal Importance

Val = Valence

Source	Df	SS	MS	F	p
Gend	1	0.000	0.000	0.00	1.00
Error	65	0.000	0.000		
Imp	1	0.422	0.422	0.39	0.53
Imp x Gend	1	0.780	0.780	0.73	0.40
Error (Imp)	65	69.846	1.075		
Val	1	104.851	104.851	99.33	0.0001
Val x Gend	1	0.075	0.075	0.07	0.79
Error (Val)	65	68.612	1.056		
Imp x Val	1	25.933	25.933	26.71	0.0001
Imp x Val x Gend	1	0.560	0.560	0.58	0.45
Error (Imp x Val)	65	63.112	0.971		

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BIOGRAPHY

Peter Fraenkel was born on April 2, 1958, in New York City. He attended The New England Conservatory of Music as a percussion major and graduated summa cum laude from Boston University in May of 1980, with degrees in philosophy and psychology. He graduated with Distinction in Psychology. While a student at Boston University he was appointed a beneficiary of the Augustus Howe Buck Educational Fund and received the Harold C. Case Scholarship, was elected to Phi Beta Kappa and Psi Chi, and was a state and national finalist for the Rhodes and Marshall Scholarships, respectively.

As a student in clinical psychology at Duke University, Mr. Fraenkel was awarded a U.S.P.H.S. Predoctoral Fellowship by the National Institute of Mental Health, was nominated by the Department of Psychology for a University Named Instructorship, and was appointed Clinic Coordinator of the Duke Psychology Clinic for two consecutive years. He recently completed his predoctoral internship in clinical psychology at Bellevue-NYU Medical Center, where he was appointed to a second year. Mr. Fraenkel is the coauthor of the following chapter: Costanzo, P. R., & Fraenkel, P. (1987). Social influence, socialization, and the development of social cognition: The heart of the matter. In N. Eisenberg (Ed.), Contemporary topics in developmental psychology. New York: Wiley.



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